ESE Framework

Release 1.1

MSP4BIO

Apr 22, 2025

INTRO:

Ecological-Socio-Economic management framework (ESE)

Enhancing protection and restoration of marine ecosystems

CHAPTER

ONE

INTRODUCTION

The Ecological-Socio-Economic management framework (ESE) is a tool-based step-by-step guidance for enhancing protection and restoration of marine ecosystems and biodiversity and integration with MSP. The framework is conceived as a user-oriented guidance, where the entry points are the purposes, the needs and the objective of the main users. The expected users of the framework are MSP authorities and marine planners, environmental authorities, MPA managers, decision maker involved in marine and coastal management. The entry point to the framework are management questions: the ESE framework presents several questions the user can select on the basis of her/his management needs. Based on the type of question, the user can navigate through the solutions offered by the different ESE modules and other outputs from the MSP4BIO project, namely:

- ESE1 Ecological Toolkit
- ESE2 - Criteria for the representation of the social and economic dimension of MPAs
- ESE3 - Trade-offs method for protections and restoration in MSP
- ESE3 - Nature-inclusive operation of blue economy sectors
- Knowledge from WP2: data, geoportals and existing criteria
- Policy solutions from WP6.

The knowledge from the above components is made available through a number of Practices (i.e operative instructions) that users can follow in order to address their questions through the application of ecological and socio-economic criteria and tools. The ESE framework also provides the user with a list measures (i.e. good practices) dealing with mainstreaming marine protection in maritime sectors and MSP.

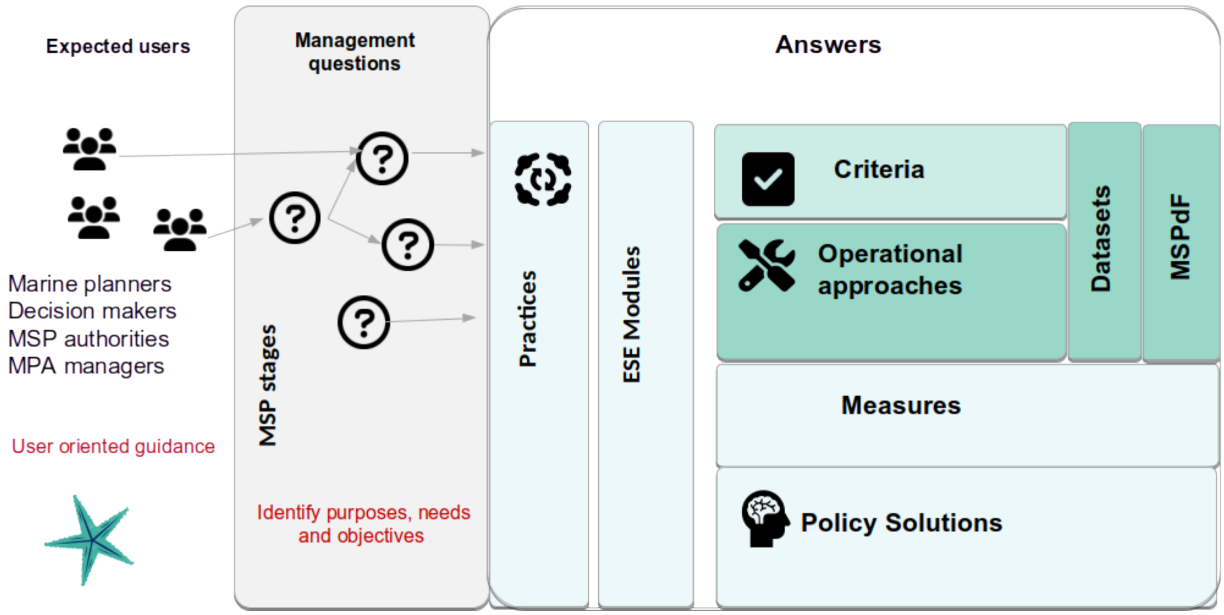


Fig. 1.1: ESE Elements

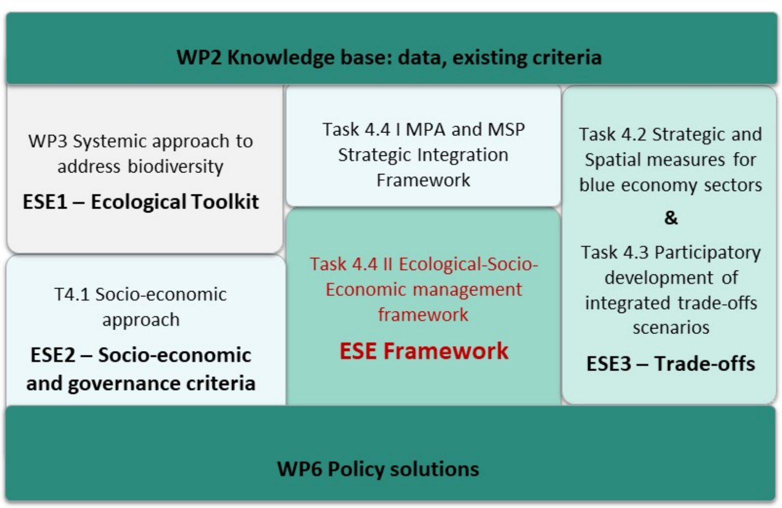


Fig. 1.2: ESE Integrations

CHAPTER

TWO

MSP4BIO

Fig. 2.1: ESE Framework

CHAPTER

THREE

GLOSSARY

[Under construction]

Answer
: In this Guidance, an Answer is a suggested approach to addressing a problem formulated as a question.

Criterion
: The term Criterion (pl. Criteria) refers to the operational principle whose information, provided by indicators (variables to infer the status of a particular criterion), can be integrated and interpreted to generate new knowledge (Prabhu et al., 2001, Prabhu et al., 1999). For illustrative purposes, a non-exhaustive list of criteria that could be considered. Examples of ecological criteria:

- Biodiversity and Species Richness: for evaluating the presence and diversity of species. Consider indicators such as species richness, species composition, and the ecological importance of the area for maintaining biodiversity.
- Habitats and Ecosystems: Assess the presence and condition of key habitats and ecosystems within the area. This may include coral reefs and seagrass meadows.
- Connectivity and Spillover Effects: Evaluate the connectivity of the MPA with surrounding areas and assess the potential for spillover effects. Consider indicators such as larval dispersal, fish movement patterns.
- Cumulative Impact on Ecosystems: Evaluate the cumulative effects of human activities on the marine ecosystems within and surrounding the MPA. Consider indicators such as the combined impacts of multiple stressors, such as fishing, pollution, coastal development, climate change, and shipping activities.
- Reproductive and Nursery Areas: Identify areas that serve as important reproductive and nursery grounds. Consider indicators such as the ecological significance of these areas for the life cycle and population dynamics of key species.

Examples of socio-economic criteria:

- Cultural and Traditional Practices: Consider the cultural and traditional practices of local communities that may be impacted by the MPA designation. Assess the potential effects on cultural heritage, local rights, and traditional resource use.
- Ecotourism and Recreation: Assess the potential for sustainable ecotourism and recreational activities within and around the MPA. Evaluate indicators such as visitor numbers, tourism revenue, the quality of visitor experiences, and the potential for job creation.
- Education: Assess the potential of the MPA to provide educational opportunities for local communities, visitors, and stakeholders. Consider indicators such as environmental education programs and public dissemination initiatives.

Criteria are not only connected to one or more management questions but they also have specific characteristics. These include being associated with a particular topic, having a connection to an ESE module, being applicable to a specific spatial and temporal scale and requiring a certain type and amount of data.

Management need
In this Guidance, Management need means a category of issues that marine managers (MPA managers, planners, decision-makers, policymakers) need to solve.

Measure
In this Guidance, a Measure is defined as a method for achieving a goal or addressing a situation (Cambridge Dictionary). The ESE framework provides a catalogue of Measures, including examples of best practices in implementing the MPA or MSP process. In the ESE, Measures are categorized based on the process phase they correspond to and the sector they are associated with. Within the ESE framework, answers may include references to relevant Measures as examples of successful solutions to specific management needs or questions.

Method
A Method is one approach that can be used to answer management needs/questions. Based on a method, tools can be developed representing practical instruments that can be applied to specific cases (e.g. models, applications, data bases).

Example: Cumulative Effect Assessment (CEA) is a method to assess cumulative impacts on marine ecosystems. Some tools are available based on CEA: e.g. Tools4MSP CEA, HELCOM SPIA tool, Planwise4Blue. The tools can also be referred to as Decision Support Tools (DSTs).

Operational approach
Operational Research is defined as the application of the methods of science to complex problems arising in the direction and management of large systems of men, machines, materials, and money in industry, business, government, and defence. The distinctive approach is to develop a scientific model of the system, incorporating measurements of factors such as chance and risk, with which to predict and compare the outcomes of alternative decisions, strategies, or controls (Operational Research Society of the United Kinkdom, Duckworth et al. 1977.

In this Guidance, the term Operational approach is used as an umbrella concept including both the methods that can be applied to answer management needs/questions, and the tools - based on the methods - that represent practical instruments that can be applied to specific cases (e.g. models, applications, databases). Example: Cumulative Effect Assessment (CEA) is a method to assess cumulative impacts on marine ecosystems. Some tools are available based on CEA: e.g. Tools4MSP CEA, HELCOM SPIA tool, Planwise4Blue. The tools are also sometimes referred to as Decision Support Tools (DSTs). Both the method and the tools are named as Operational approaches in the context of this Guidance.

Practice
The term Practice refers to a structured methodology or approach that helps users make informed decisions. In this Guidance, a practice suggests a possible approach to answer a Question. In some cases, a Practice can also refer to a particularly complex process that requires multiple cycles of interaction, intermediate phases and the combination of sub-practices or steps that serve to describe a single phase. A Practice can suggest the use of criteria and indicators and explain how to combine them. A Practice can contain instructions/documentation on how to use the criteria/indicators to support decisions (e.g. threshold/weights to combine criteria results). A Practice can also suggest the use of one or more decision-support tools.

Question
A question represents a problem the user is interested in solving, generally in a particular geographical context (sea basin, national, regional/local). A question is a specification of a more general management need (e.g. strengthening conservation).

Solution
In this Guidance, a Solution is intended as a process or an approach that can be undertaken to face a spefic problem. The ESE framework refers to Solutions about policy-related processes or approaches that might be useful to consider in a specific context. Policy Solutions are provided in this Guidance as a catalogue. They are also associated with Answers, where pertinent.

Tool
In this Guidance, the term Tool is used to define one specific practical instrument (e.g. a model, an application, a database) that can be applied to specific cases. Tools - also named Decision Support Tools (DSTs) - are based

on Methods that represent their conceptual base. Example: Cumulative Effect Assessment (CEA) is a method to assess cumulative impacts on marine ecosystems. Some tools are available based on CEA: e.g. Tools4MSP CEA, HELCOM SPIA tool, Planwise4Blue. In this Guidance, both Methods and Tools are collectively named as Operational approaches.

CHAPTER

FOUR

MANAGEMENT NEEDS

4.1 Strengthening Conservation

4.1.1 Description

This management need includes, in its scope, the identification of valuable/vulnerable areas, assessment of cumulative impacts of human activities on marine ecosystems, the identification and designation of new MPAs, their enlargement, effectiveness assessment, the improvement of connectivity within existing MPA networks, including Climate change-related considerations, and restoration. Monitoring related issues are also considered when referring to conservation.

4.1.2 Related questions

- Level 1 *Q 65 - How can we assess CC impacts on fishing stocks (e.g. cod and sprat) and develop strategies to protect these species across different life stages (e.g. focusing on nurseries and fishing grounds)?*
- Level 1 *Q 34 - How to achieve the strict protection area target of 10% by 2030 in marine areas?*
- Level 1 *Q 38 - How to address ecological functionalities in conservation objectives?*
- Level 1 *Q 47 - How to address the different scales of management (MSP-MPA) in an ESE framework?*
- Level 1 *Q 54 - How to anticipate and address climate change within MPA?*
  - Level 2 *Q 55 - How to anticipate and address climate change within a MPA network?*
- Level 1 *Q 56 - How to anticipate changes in biotopes due to climate change?*
  - Level 2 *Q 57 - How to prioritize areas to be protected in view of climate changes (including shertered areas)?*
  - Level 2 *Q 60 - What is the impact of CC on deep ecosystems?*
  - Level 2 *Q 59 - What is the impact of CC on marine mammals?*
- Level 1 *Q 35 - How to assess and develop scenarios for MPA networks representativeness, ecological coherence, adequacy, comprehensiveness and connectivity. also in transboundary contexts?*
- Level 1 *Q 9 - How to effectively manage conservation areas including both terrestrial and marine zones?*
- Level 1 *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*
- Level 1 *Q 16 - How to prioritize areas for conservation (designation of new MPAs)?*
  - Level 2 *Q 17 - How to identify priority areas for conservation of pelagic biodiversity?*
  - Level 2 *Q 18 - How to identify priority areas for preserving/restoring reef-forming species such as oysters Lanice conchilega or mussels?*

    * Level 3 *Q 6 - What are the priority areas for preserving from climate change effects the reef-former Lanice conchilega?*

  - Level 2 *Q 37 - How to maintain local retention / population persistence within the MPA?*
  - Level 2 *Q 36 - How to maintain mobile species persistence (and connectivity) and population/community persistence (passive connectivity) across a transboundary MPA?*
  - Level 2 *Q 58 - How to protect vulnerable species against climatic stressors?*
  - Level 2 *Q 33 - What are the environmental legislation/criteria guidance for MPA designation including socio-economic criteria (Commission's SWD, EU Directives, IUCN, new criteria UNCLOS?)*

- Level 1 *Q 41 - What are the main objectives and elements of monitoring programs for MPAs?*
  - Level 2 *Q 43 - How to monitor Ecosystem Services highlighting their linkages to the different high priority socio-economic criteria identified in each site?*
  - Level 2 *Q 42 - What monitoring approach can be taken for extensive MPA networks, expecially offshore ones?*

Edit online (for developers only)

4.2 Balancing between economics and conservation

4.2.1 Description

This management need includes, in its scope, consideration of socio-economic aspects in MPA establishment or enlargement. This also includes ensuring that trade-offs between maritime economy and conservation are identified or improved (eventually as part of the MSP process), including, eventually, the identification of compensation measures.

4.2.2 Related questions

- Level 1 *Q 53 - How to identify and analyze the main conflict areas between human uses and the environment?*
  - Level 2 *Q 8 - How to identify and analyze the main conflict area that may arise if we need to expand marine protected areas in response to sensitive habitats, ecological connectivity or other valuable ecological as*
- Level 1 *Q 11 - How to integrate socio-econonomic objectives in assessment of existing MPA (network) and identification of new MPAs?*
  - Level 2 *Q 46 - Hot to identify compensation measures and how to assess their effectiveness?*
  - Level 2 *Q 45 - How to assess economic impacts of conservation measures?*
  - Level 2 *Q 13 - How to evaluate trade-offs in MSP and MPA designation process?*

Edit online (for developers only)

4.3 Integrated management of marine ecosystems

4.3.1 Description

This management need includes, in its scope, improving the management of marine ecosystems and their services as part of an MPA and/or MSP process, including strengthening the sustainability of maritime activities and enhancing compatibility between uses and marine protection.

4.3.2 Related questions

- Level 1 *Q 61 - How can reliability/accuracy of the spatial data for MPA identification be improved?*
  - Level 2 *Q 64 - How to deal with knowledge gaps on impacts of maritime activities, including cumulative impacts?*
  - Level 2 *Q 63 - How to deal with knowledge gaps on socio-economic data, including the spatial dimension?*
  - Level 2 *Q 62 - How to deal with knowledge gaps related to water column data to support establishment of conservation measures offshore?*
- Level 1 *Q 24 - How do MPA policies intersect with MSP?*
  - Level 2 *Q 25 - How to integrate the process of MPA designation or extension in MSP?*
    - Level 3 *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
    - Level 3 *Q 26 - How to take OECM into consideration in MSP where no legal instruments are in place?*
- Level 1 *Q 7 - How to protect deep Vulnerable marine Ecosystems (VMEs) (strategies, measures, etc.)?*
  - Level 2 *Q 50 - How can deep-water VMEs be effectively identified and conserved with regards to anthropogenic impacts arising from human activities?*
    - Level 3 *Q 51 - How can we minimize the impact of bottom trawling on the growth and survival of gorgonians and other cold water corals located in the NWMED deep-water VMEs?*
- Level 1 *Q 10 - How to protect marine mammals?*
  - Level 2 *Q 49 - How to manage cross-border MPAs for cetaceans conservation?*
  - Level 2 *Q 48 - How to reduce risks (e.g. of collision) and impacts (e.g. from noise pollution) on key cetacean species, particularly during the breeding season and in sensitive areas?*
- Level 1 *Q 52 - How to protect pelagic habitats?*
- Level 1 *Q 39 - What criteria are available to assess sustainability of maritime uses?*
  - Level 2 *Q 14 - How to assess compatibility of maritime uses and MPA conservation objectives? How to prioritize uses?*

Edit online (for developers only)

4.4 Stakeholder engagement, participation, co-creation

4.4.1 Description

This management need includes, in its scope, ensuring stakeholders are engaged in the planning process for MPA and/or MSP, including promoting their participation in the co-creation of solutions to enhance ecosystem and biodiversity protection (e.g. co-management of MPAs).

4.4.2 Related questions

- Level 1 *Q 28 - How to create/increase stakeholder knowledge, awareness and engagement on MPAs and MSP?*
  - Level 2 *Q 29 - How to assess stakeholders' satisfaction in a MSP/MPA process?*
  - Level 2 *Q 32 - How to create a culture of collaboration among MSP, MPA and sector responsible institutions?*
  - Level 2 *Q 30 - How to demostrate the effectiveness of conservation measures to stakeholders?*
  - Level 2 *Q 31 - How to move from participation to engagement and co-creation, transforming participation in a cultural behaviour?*

Edit online (for developers only)

CHAPTER

FIVE

MSP STAGES

5.1 Starting the process

5.1.1 Related questions

- Level 1 *Q 65 - How can we assess CC impacts on fishing stocks (e.g. cod and sprat) and develop strategies to protect these species across different life stages (e.g. focusing on nurseries and fishing grounds)?*
- Level 1 *Q 24 - How do MPA policies intersect with MSP?*
  - Level 2 *Q 25 - How to integrate the process of MPA designation or extension in MSP?*
    - Level 3 *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
    - Level 3 *Q 26 - How to take OECM into consideration in MSP where no legal instruments are in place?*
- Level 1 *Q 38 - How to address ecological functionalities in conservation objectives?*
- Level 1 *Q 28 - How to create/increase stakeholder knowledge, awareness and engagement on MPAs and MSP?*
  - Level 2 *Q 29 - How to assess stakeholders' satisfaction in a MSP/MPA process?*
  - Level 2 *Q 32 - How to create a culture of collaboration among MSP, MPA and sector responsible institutions?*
  - Level 2 *Q 30 - How to demostrate the effectiveness of conservation measures to stakeholders?*
  - Level 2 *Q 31 - How to move from participation to engagement and co-creation, transforming participation in a cultural behaviour?*

Edit online (for developers only)

5.2 Assessing the context and defining a vision

5.2.1 Related questions

- Level 1 *Q 65 - How can we assess CC impacts on fishing stocks (e.g. cod and sprat) and develop strategies to protect these species across different life stages (e.g. focusing on nurseries and fishing grounds)?*
- Level 1 *Q 24 - How do MPA policies intersect with MSP?*
  - Level 2 *Q 25 - How to integrate the process of MPA designation or extension in MSP?*
    - Level 3 *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
    - Level 3 *Q 26 - How to take OECM into consideration in MSP where no legal instruments are in place?*
- Level 1 *Q 38 - How to address ecological functionalities in conservation objectives?*

- Level 1 *Q 28 - How to create/increase stakeholder knowledge, awareness and engagement on MPAs and MSP?*
  - Level 2 *Q 29 - How to assess stakeholders' satisfaction in a MSP/MPA process?*
  - Level 2 *Q 32 - How to create a culture of collaboration among MSP, MPA and sector responsible institutions?*
  - Level 2 *Q 30 - How to demostrate the effectiveness of conservation measures to stakeholders?*
  - Level 2 *Q 31 - How to move from participation to engagement and co-creation, transforming participation in a cultural behaviour?*
- Level 1 *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*

Edit online (for developers only)

5.3 Analyzing existing and future conditions

5.3.1 Related questions

- Level 1 *Q 65 - How can we assess CC impacts on fishing stocks (e.g. cod and sprat) and develop strategies to protect these species across different life stages (e.g. focusing on nurseries and fishing grounds)?*
- Level 1 *Q 24 - How do MPA policies intersect with MSP?*
  - Level 2 *Q 25 - How to integrate the process of MPA designation or extension in MSP?*
    - Level 3 *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
    - Level 3 *Q 26 - How to take OECM into consideration in MSP where no legal instruments are in place?*
- Level 1 *Q 38 - How to address ecological functionalities in conservation objectives?*
- Level 1 *Q 54 - How to anticipate and address climate change within MPA?*
  - Level 2 *Q 55 - How to anticipate and address climate change within a MPA network?*
- Level 1 *Q 28 - How to create/increase stakeholder knowledge, awareness and engagement on MPAs and MSP?*
  - Level 2 *Q 29 - How to assess stakeholders' satisfaction in a MSP/MPA process?*
  - Level 2 *Q 32 - How to create a culture of collaboration among MSP, MPA and sector responsible institutions?*
  - Level 2 *Q 30 - How to demostrate the effectiveness of conservation measures to stakeholders?*
  - Level 2 *Q 31 - How to move from participation to engagement and co-creation, transforming participation in a cultural behaviour?*
- Level 1 *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*

Edit online (for developers only)

5.4 Identifying key issues

5.4.1 Related questions

- Level 1 *Q 65 - How can we assess CC impacts on fishing stocks (e.g. cod and sprat) and develop strategies to protect these species across different life stages (e.g. focusing on nurseries and fishing grounds)?*
- Level 1 *Q 24 - How do MPA policies intersect with MSP?*
  - Level 2 *Q 25 - How to integrate the process of MPA designation or extension in MSP?*

        * Level 3 *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
        * Level 3 *Q 26 - How to take OECM into consideration in MSP where no legal instruments are in place?*
- Level 1 *Q 38 - How to address ecological functionalities in conservation objectives?*
- Level 1 *Q 54 - How to anticipate and address climate change within MPA?*
    - Level 2 *Q 55 - How to anticipate and address climate change within a MPA network?*
- Level 1 *Q 28 - How to create/increase stakeholder knowledge, awareness and engagement on MPAs and MSP?*
    - Level 2 *Q 29 - How to assess stakeholders' satisfaction in a MSP/MPA process?*
    - Level 2 *Q 32 - How to create a culture of collaboration among MSP, MPA and sector responsible institutions?*
    - Level 2 *Q 30 - How to demostrate the effectiveness of conservation measures to stakeholders?*
    - Level 2 *Q 31 - How to move from participation to engagement and co-creation, transforming participation in a cultural behaviour?*
- Level 1 *Q 9 - How to effectively manage conservation areas including both terrestrial and marine zones?*
- Level 1 *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*
- Level 1 *Q 10 - How to protect marine mammals?*
    - Level 2 *Q 49 - How to manage cross-border MPAs for cetaceans conservation?*
    - Level 2 *Q 48 - How to reduce risks (e.g. of collision) and impacts (e.g. from noise pollution) on key cetacean species, particularly during the breeding season and in sensitive areas?*
- Level 1 *Q 39 - What criteria are available to assess sustainability of maritime uses?*
    - Level 2 *Q 14 - How to assess compatibility of maritime uses and MPA conservation objectives? How to prioritize uses?*

Edit online (for developers only)

5.5 Elaborating the plan

5.5.1 Related questions

- Level 1 *Q 61 - How can reliability/accuracy of the spatial data for MPA identification be improved?*
    - Level 2 *Q 64 - How to deal with knowledge gaps on impacts of maritime activities, including cumulative impacts?*
    - Level 2 *Q 63 - How to deal with knowledge gaps on socio-economic data, including the spatial dimension?*
    - Level 2 *Q 62 - How to deal with knowledge gaps related to water column data to support establishment of conservation measures offshore?*
- Level 1 *Q 65 - How can we assess CC impacts on fishing stocks (e.g. cod and sprat) and develop strategies to protect these species across different life stages (e.g. focusing on nurseries and fishing grounds)?*
- Level 1 *Q 24 - How do MPA policies intersect with MSP?*
    - Level 2 *Q 25 - How to integrate the process of MPA designation or extension in MSP?*
        * Level 3 *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
        * Level 3 *Q 26 - How to take OECM into consideration in MSP where no legal instruments are in place?*
- Level 1 *Q 34 - How to achieve the strict protection area target of 10% by 2030 in marine areas?*

- Level 1 *Q 38 - How to address ecological functionalities in conservation objectives?*
- Level 1 *Q 47 - How to address the different scales of management (MSP-MPA) in an ESE framework?*
- Level 1 *Q 54 - How to anticipate and address climate change within MPA?*
  - Level 2 *Q 55 - How to anticipate and address climate change within a MPA network?*
- Level 1 *Q 56 - How to anticipate changes in biotopes due to climate change?*
  - Level 2 *Q 57 - How to prioritize areas to be protected in view of climate changes (including shertered areas)?*
  - Level 2 *Q 60 - What is the impact of CC on deep ecosystems?*
  - Level 2 *Q 59 - What is the impact of CC on marine mammals?*
- Level 1 *Q 35 - How to assess and develop scenarios for MPA networks representativeness, ecological coherence, adequacy, comprehensiveness and connectivity. also in transboundary contexts?*
- Level 1 *Q 28 - How to create/increase stakeholder knowledge, awareness and engagement on MPAs and MSP?*
  - Level 2 *Q 29 - How to assess stakeholders' satisfaction in a MSP/MPA process?*
  - Level 2 *Q 32 - How to create a culture of collaboration among MSP, MPA and sector responsible institutions?*
  - Level 2 *Q 30 - How to demostrate the effectiveness of conservation measures to stakeholders?*
  - Level 2 *Q 31 - How to move from participation to engagement and co-creation, transforming participation in a cultural behaviour?*
- Level 1 *Q 9 - How to effectively manage conservation areas including both terrestrial and marine zones?*
- Level 1 *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*
- Level 1 *Q 53 - How to identify and analyze the main conflict areas between human uses and the environment?*
  - Level 2 *Q 8 - How to identify and analyze the main conflict area that may arise if we need to expand marine protected areas in response to sensitive habitats, ecological connectivity or other valuable ecological as*
- Level 1 *Q 11 - How to integrate socio-econonomic objectives in assessment of existing MPA (network) and identification of new MPAs?*
  - Level 2 *Q 46 - Hot to identify compensation measures and how to assess their effectiveness?*
  - Level 2 *Q 45 - How to assess economic impacts of conservation measures?*
  - Level 2 *Q 13 - How to evaluate trade-offs in MSP and MPA designation process?*
- Level 1 *Q 16 - How to prioritize areas for conservation (designation of new MPAs)?*
  - Level 2 *Q 17 - How to identify priority areas for conservation of pelagic biodiversity?*
  - Level 2 *Q 18 - How to identify priority areas for preserving/restoring reef-forming species such as oysters Lanice conchilega or mussels?*
    - Level 3 *Q 6 - What are the priority areas for preserving from climate change effects the reef-former Lanice conchilega?*
  - Level 2 *Q 37 - How to maintain local retention / population persistence within the MPA?*
  - Level 2 *Q 36 - How to maintain mobile species persistence (and connectivity) and population/community persistence (passive connectivity) across a transboundary MPA?*
  - Level 2 *Q 58 - How to protect vulnerable species against climatic stressors?*
  - Level 2 *Q 33 - What are the environmental legislation/criteria guidance for MPA designation including socio-economic criteria (Commission's SWD, EU Directives, IUCN, new criteria UNCLOS?)*
- Level 1 *Q 7 - How to protect deep Vulnerable marine Ecosystems (VMEs) (strategies, measures, etc.)?*

- Level 2 *Q 50 - How can deep-water VMEs be effectively identified and conserved with regards to anthropogenic impacts arising from human activities?*
  - Level 3 *Q 51 - How can we minimize the impact of bottom trawling on the growth and survival of gorgonians and other cold water corals located in the NWMED deep-water VMEs?*
- Level 1 *Q 10 - How to protect marine mammals?*
  - Level 2 *Q 49 - How to manage cross-border MPAs for cetaceans conservation?*
  - Level 2 *Q 48 - How to reduce risks (e.g. of collision) and impacts (e.g. from noise pollution) on key cetacean species, particularly during the breeding season and in sensitive areas?*
- Level 1 *Q 52 - How to protect pelagic habitats?*
- Level 1 *Q 39 - What criteria are available to assess sustainability of maritime uses?*
  - Level 2 *Q 14 - How to assess compatibility of maritime uses and MPA conservation objectives? How to prioritize uses?*

Edit online (for developers only)

5.6 Implementing

5.6.1 Related questions

- Level 1 *Q 24 - How do MPA policies intersect with MSP?*
  - Level 2 *Q 25 - How to integrate the process of MPA designation or extension in MSP?*
    - Level 3 *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
    - Level 3 *Q 26 - How to take OECM into consideration in MSP where no legal instruments are in place?*
- Level 1 *Q 28 - How to create/increase stakeholder knowledge, awareness and engagement on MPAs and MSP?*
  - Level 2 *Q 29 - How to assess stakeholders' satisfaction in a MSP/MPA process?*
  - Level 2 *Q 32 - How to create a culture of collaboration among MSP, MPA and sector responsible institutions?*
  - Level 2 *Q 30 - How to demostrate the effectiveness of conservation measures to stakeholders?*
  - Level 2 *Q 31 - How to move from participation to engagement and co-creation, transforming participation in a cultural behaviour?*
- Level 1 *Q 9 - How to effectively manage conservation areas including both terrestrial and marine zones?*
- Level 1 *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*
- Level 1 *Q 7 - How to protect deep Vulnerable marine Ecosystems (VMEs) (strategies, measures, etc.)?*
  - Level 2 *Q 50 - How can deep-water VMEs be effectively identified and conserved with regards to anthropogenic impacts arising from human activities?*
    - Level 3 *Q 51 - How can we minimize the impact of bottom trawling on the growth and survival of gorgonians and other cold water corals located in the NWMED deep-water VMEs?*
- Level 1 *Q 52 - How to protect pelagic habitats?*

Edit online (for developers only)

5.7 Monitoring

5.7.1 Related questions

- Level 1 *Q 24 - How do MPA policies intersect with MSP?*
  - Level 2 *Q 25 - How to integrate the process of MPA designation or extension in MSP?*
    - Level 3 *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
    - Level 3 *Q 26 - How to take OECM into consideration in MSP where no legal instruments are in place?*
- Level 1 *Q 28 - How to create/increase stakeholder knowledge, awareness and engagement on MPAs and MSP?*
  - Level 2 *Q 29 - How to assess stakeholders' satisfaction in a MSP/MPA process?*
  - Level 2 *Q 32 - How to create a culture of collaboration among MSP, MPA and sector responsible institutions?*
  - Level 2 *Q 30 - How to demostrate the effectiveness of conservation measures to stakeholders?*
  - Level 2 *Q 31 - How to move from participation to engagement and co-creation, transforming participation in a cultural behaviour?*
- Level 1 *Q 9 - How to effectively manage conservation areas including both terrestrial and marine zones?*
- Level 1 *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*
- Level 1 *Q 7 - How to protect deep Vulnerable marine Ecosystems (VMEs) (strategies, measures, etc.)?*
  - Level 2 *Q 50 - How can deep-water VMEs be effectively identified and conserved with regards to anthropogenic impacts arising from human activities?*
    - Level 3 *Q 51 - How can we minimize the impact of bottom trawling on the growth and survival of gorgonians and other cold water corals located in the NWMED deep-water VMEs?*
- Level 1 *Q 41 - What are the main objectives and elements of monitoring programs for MPAs?*
  - Level 2 *Q 43 - How to monitor Ecosystem Services highlighting their linkages to the different high priority socio-economic criteria identified in each site?*
  - Level 2 *Q 42 - What monitoring approach can be taken for extensive MPA networks, expecially offshore ones?*

Edit online (for developers only)

5.8 Assessment

5.8.1 Related questions

- Level 1 *Q 24 - How do MPA policies intersect with MSP?*
  - Level 2 *Q 25 - How to integrate the process of MPA designation or extension in MSP?*
    - Level 3 *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
    - Level 3 *Q 26 - How to take OECM into consideration in MSP where no legal instruments are in place?*
- Level 1 *Q 28 - How to create/increase stakeholder knowledge, awareness and engagement on MPAs and MSP?*
  - Level 2 *Q 29 - How to assess stakeholders' satisfaction in a MSP/MPA process?*
  - Level 2 *Q 32 - How to create a culture of collaboration among MSP, MPA and sector responsible institutions?*
  - Level 2 *Q 30 - How to demostrate the effectiveness of conservation measures to stakeholders?*

    - Level 2 *Q 31 - How to move from participation to engagement and co-creation, transforming participation in a cultural behaviour?*
- Level 1 *Q 9 - How to effectively manage conservation areas including both terrestrial and marine zones?*
- Level 1 *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*
- Level 1 *Q 7 - How to protect deep Vulnerable marine Ecosystems (VMEs) (strategies, measures, etc.)?*
    - Level 2 *Q 50 - How can deep-water VMEs be effectively identified and conserved with regards to anthropogenic impacts arising from human activities?*
        - Level 3 *Q 51 - How can we minimize the impact of bottom trawling on the growth and survival of gorgonians and other cold water corals located in the NWMED deep-water VMEs?*

Edit online (for developers only)

5.9 Revision

5.9.1 Related questions

- Level 1 *Q 24 - How do MPA policies intersect with MSP?*
    - Level 2 *Q 25 - How to integrate the process of MPA designation or extension in MSP?*
        - Level 3 *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
        - Level 3 *Q 26 - How to take OECM into consideration in MSP where no legal instruments are in place?*
- Level 1 *Q 34 - How to achieve the strict protection area target of 10% by 2030 in marine areas?*
- Level 1 *Q 28 - How to create/increase stakeholder knowledge, awareness and engagement on MPAs and MSP?*
    - Level 2 *Q 29 - How to assess stakeholders' satisfaction in a MSP/MPA process?*
    - Level 2 *Q 32 - How to create a culture of collaboration among MSP, MPA and sector responsible institutions?*
    - Level 2 *Q 30 - How to demostrate the effectiveness of conservation measures to stakeholders?*
    - Level 2 *Q 31 - How to move from participation to engagement and co-creation, transforming participation in a cultural behaviour?*
- Level 1 *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*

Edit online (for developers only)

CHAPTER

SIX

ESE MODULES

6.1 Policy solutions

6.1.1 Description

Through an iterative, stakeholder-driven process, MSP4BIO Task 6.2 identified policy solutions addressing institutional coordination, policy integration, stakeholder involvement, funding mechanisms, capacity building, and technical support at the national, regional, and EU levels. These solutions were developed in collaboration with project partners, tested through country-specific engagements, and validated through regional and EU-level discussions, including think tank meetings and contributions from the stakeholders. The document presents a structured approach to future policy directions, offering practical solutions to align MSP with biodiversity objectives and enhance coordination across governance levels, supporting the effective implementation of the EUBS2030 in coastal and marine regions.

Edit online (for developers only)

6.2 ESE1 - Ecological toolkit

6.2.1 Description

ESE1, the Ecological Toolkit, improves decision-making processes for MPAs by helping to prioritise protected areas, integrate connectivity processes and assess the impacts of human activities on marine ecosystems for both current and future scenarios. The Toolkit provides a range of solutions and a comprehensive step-by-step guide to help decision-makers navigate the complex processes of MPA prioritisation and connectivity. ESE1 integrates a set of operational and enhanced ecological and climate-related criteria derived from systematic reviews and desktop analyses as outlined in MSP4BIO project WP2 (D2.2) and WP3 (D3.2 and D3.3). It also includes guidance on incorporating climate change scenarios into protection and prioritisation strategies for the development of climate-smart MPAs, as detailed in WP3, D3.3. This comprehensive approach will ensure that MPAs are designed and managed with the latest ecological knowledge and climate resilience principles. Based on a curated set of ecological criteria, this guide guides through the essential steps of vulnerability assessment for prioritising conservation actions in MPAs. It provides methodologies that equip stakeholders with the tools to develop conservation scenarios that are resilient to climate change.

References

- Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

6.2.2 Additional details

ESE1 - Ecological toolkit (Scoping)

Additional steps of the scoping phase, relevant for the ecological aspects:

- Definition of the ecological approach. Clarify whether the approach is area-based, species-based or a combination of both.
- Specification of the bio-ecological target. Identify the elements of priority for conservation, from individual species to ecosystem level, based on the scope and geographical area of the question, specifying the target as precisely as possible (e.g., Vulnerable Marine Ecosystems - VME, whales, Posidonia meadows) and the species level where available (e.g., Eunicella cavolinii). Elements to support decision making in the face of climate change can be found in the D3.3 guide.
- Identification of the criteria to prioritize species/ecosystems for conservation. This step defines the identification of conservation priorities, supported by the lists of species/habitat priority conservation criteria at global, European and regional levels and clustered at the level of geographical regions, as reported in D2.2 (Table 9, Annex 2). Detailed guidance on how to prioritise ecological elements and related criteria is also reported in D3.3, section 2.5. Table 2 in D3.3 reports a step-by-step process, modified from Swan et al. (2017), for identifying key species. The most common strategy is risk or threat assessment (Le Berre et al., 2019). Another strategy is based on vulnerability to specific threats due to climate change and/or human activities. Other approaches can be based on conservation concerns (intrinsic value of species, e.g., rarity or local distribution and endemism, national importance, genetic or taxonomic uniqueness, phylogenetic distinctiveness) or value of resources or ecosystem services (economic value, attractive species, cultural importance) or ecological distinctiveness (e.g., ecological range, functional role, keystone species, propagation potential, La Berre et al., 2019). The three main criteria for species prioritization are: (1) Services criteria (role that the species deliver to human, including social and economic indicators, generally ranked by the users themselves (D4.1), (2) Ecological criteria (role that the species exerts in the environment and trophic networks that could also be linked to species traits, D2.2 and D3.2) and (3) Climatic/non-climatic criteria linked to species sensitivity (including resistance, recovery and adaptive potential) link to their inner traits (see D3.3). The three rankings will provide a final score that could highlight the species to prioritize regarding the creation of management patterns. This ranking system needs to be defined and is outside the scope of this deliverable.
- Identification of macro-criteria and potential methodological strategies (to be analysed in the following practices). In this step macro-criteria are indicated depending on the other defined scoping steps, and methodological approaches are suggested. This step also guides practices 2-4. When a macro-criterion is identified in the scoping, a selection of inner criteria and suggested methodological strategies will follow (e.g., for vulnerability, cf. Section 3.1.2).

ESE1 - Ecological toolkit (Analysis and diagnosis)

To clarify and quantify the cause-effect nexus, macro-criteria should be assessed by using their respective indicators, and specific DSTs can be applied.

References

- Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

6.3 ESE2 - Criteria for the representation of the social and economic dimension of MPAs

6.3.1 Description

ESE2 provides socio-economic and governance criteria to support the prioritization of proposals for new Marine Protected Areas, revised MPA boundaries, reallocations, and more. Collectively, these criteria provide a framework considering the MSP process and ensuring a comprehensive approach to decision-making. Regarding governance criteria, ESE2 is based on a common regulatory framework at the EU level which leads to a homogenization in prioritizing them across different sites. These criteria are generic and strategic for any MSP process, as well as for the designation or management of an MPA. This part of ESE2 presents, among the steps of an MSP process, the implementation of strategic planning, as well as the need for adaptive management through monitoring and feedback. Regarding the socio-economic criteria, these are expected to vary in relevance for the different sites. The relevance of socio-economic criteria depends on site-specific aspects such as national and local objectives, and the ecosystem under protection. ESE2 also provides links between socio-economic criteria and ecosystem services. It was ranked by all test sites in the 2nd CoP interaction. This component is of particular importance to be used in stakeholder consultation at site level, when comparing alternative scenarios for MPAs, within and outside of MSP processes.

Source Pegorelli et al. (2024). Criteria for the representation of the social and economic dimension of MPAs. Deliverable – D4.1., under the WP4 of MSP4BIO project (GA n° 101060707)).

Edit online (for developers only)

6.4 ESE3 - Trade-offs method for protections and restoration in MSP

6.4.1 Description

ESE3 provides a guideline for the participatory creation of integrated trade-off scenarios. Scenario-building to explore trade-offs can help to improve the management of marine spaces and safeguard ecosystem services. These scenarios aim to assess and negotiate the consequences of diverse actions and strategies regarding the spatial and strategic management of marine areas.

The key element of the approach is to understand how various human activities can influence and are influenced by the ecosystem's services and find potential ways for negotiating solutions. The outcomes, particularly the trade-off scenario guidelines, can be integrated into practical tools and frameworks, aiding decision-making processes related to marine resource management.

Effective management of trade-offs involves stakeholder engagement, scientific analysis, and the utilisation of decision-support tools (DST) to pinpoint optimal solutions that minimise negative impacts while maximising overall benefits. Trade-offs manifest in close association with specific goals, interests, and activities.

Various types of trade-offs can be categorised:

1. Trade-off between conservation and economic development objectives: MSP necessitates a delicate equilibrium between safeguarding marine ecosystems and supporting economic activities such as fishing, shipping, and tourism. For instance, the designation of MPAs can restrict opportunities for fishing and tourism, affecting the monetary revenue generated from these activities.

2. Trade-off between short-term and long-term benefits: MSP must balance the immediate gains of specific activities and the long-term benefits of preserving marine ecosystems. For instance, permitting oil and gas exploration and drilling may offer short-term economic benefits but could produce irreversible impacts the environment and marine life.

3. Trade-off between exclusive uses and shared uses: Decision-making on allocating marine space may involve trade-offs between exclusive use for a specific activity or multiple shared uses. This requires considering diverse stakeholder interests and balancing activities like fishing,, recreational zones, shipping lanes and conservation activities.
4. Trade-off between specific stakeholder interests: Divergent priorities and objectives among stakeholders, including commercial fishermen, local communities, conservation organisations, researchers, maritime tour operators, and non-governmental organisations, necessitate trade-offs to accommodate varied perspectives.
5. Trade-offs between local and regional interests: While MSP can benefit local communities through economic development and job creation, it must also account for the impact of human activities on the global ocean ecosystem.

Source Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

Edit online (for developers only)

6.5 ESE3 - Nature-inclusive operation of blue economy sectors

6.5.1 Description

Complementary and as supporting material to the trade-off methos, ESE3 provides a non-exhaustive list of effective management practices tailored to some key maritime sectors: fishery, tourism, aquaculture, marine non-living resource extraction, renewable energy. This list aims to inform the activity of sectors inside and/or near MPs, providing knowledge base to understand interactions and possible impacts, as well as examples of good management practices for uptake by some key sectors operating within or in the vicinity of MPAs. The practices showcase actions that embody a balanced and sustainable approach to the blue economy and may serve as a guide to fostering responsible and sustainable practices that support both economic interests and environmental conservation. For each sector a factsheet is provided, including crucial information such as essential sector characteristics, a detailed list of sector-specific activities, a Sankey diagram to visualize sectors, pressures, and impacted ecosystem services hierarchically, and brief insights into exemplary management practices.

Source Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

Edit online (for developers only)

CHAPTER

SEVEN

QUESTIONS

7.1 Q 61 - How can reliability/accuracy of the spatial data for MPA identification be improved?

Narrower "Questions"

- *Q 64 - How to deal with knowledge gaps on impacts of maritime activities, including cumulative impacts?*
- *Q 63 - How to deal with knowledge gaps on socio-economic data, including the spatial dimension?*
- *Q 62 - How to deal with knowledge gaps related to water column data to support establishment of conservation measures offshore?*

Related sites

- *Western Black Sea*

7.1.1 General answer

Improving the reliability and accuracy of spatial data for Marine Protected Area (MPA) identification involves a combination of better data collection, integration, validation, and management practices:

1. **Invest in Knowledge Expansion and Data Collection**:

- **Filling information gaps:** This includes gathering high-quality, accessible data on marine ecosystems and stakeholder interests to inform planning processes accurately.
- **Multisectoral Data:** Combine ecological, socioeconomic, and governance data to reflect the multidimensional nature of MPAs.
- **Harmonized Formats:** Standardize data formats across sources to ensure compatibility and avoid discrepancies.
- **Historical Data:** Include time-series data to assess trends and changes in biodiversity and ecosystem conditions.

2. **Utilize Participatory Mapping**: Engaging local communities and stakeholders through participatory mapping can enrich the spatial data pool.
3. **Continuous Monitoring and Data Validation**:

- **Temporal Updates:** Ensure data is up-to-date to reflect recent ecological changes and human activities.
- **Monitoring Protocols:** Develop systematic monitoring protocols to track MPA conditions and enforce spatial boundaries.

4. **Capacity Building and Collaboration**

- **Training Programs:** Train local stakeholders and researchers in geospatial analysis and data collection techniques.

- **Collaborative Networks:** Partner with global initiatives like EMODnet, Copernicus, or national marine spatial data platforms to access validated datasets.
- **Citizen Science:** Incorporate community observations and contributions, validated against professional standards.

5. **Policy and Governance Support**

- **Data Sharing Agreements:** Foster open data sharing among institutions, ensuring transparency and reduced duplication of efforts.
- **Legal Frameworks:** Align spatial data collection and processing with international standards like the Marine Spatial Data Infrastructure (MSDI).
- **Ethical Considerations:** Address data biases and ensure inclusivity in representing ecosystems and stakeholder interests.

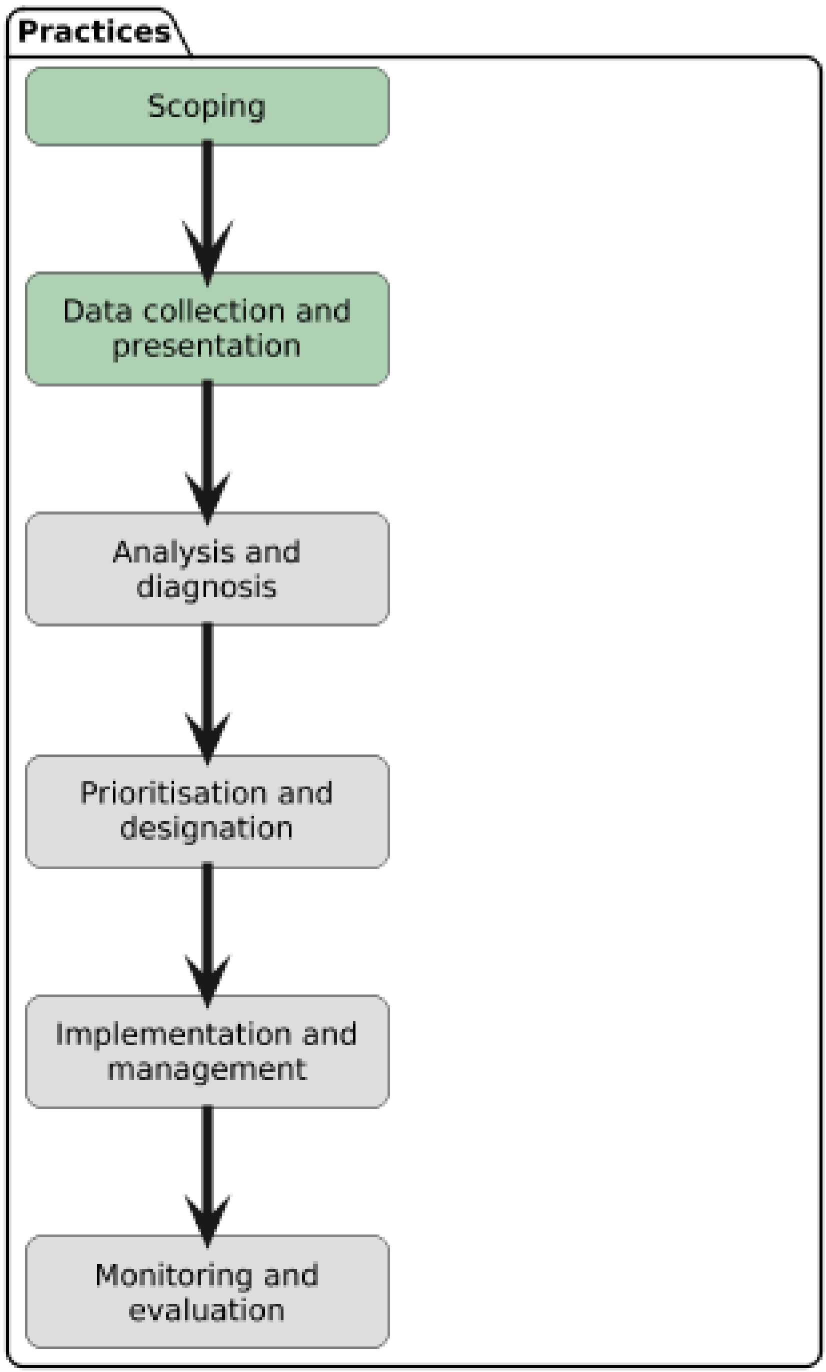
6. **Identifying and Leveraging the Best Available Resources**

Identifying, accessing, and integrating data from local, national, European, and international infrastructures—both official and non-official—is crucial for comprehensive and accurate MPA identification.

- **European and International (Official):**
  - **EMODnet (European Marine Observation and Data Network):** Provides harmonized data on bathymetry, habitats, maritime traffic, biodiversity, and human activities. [https://emodnet.ec.europa.eu/{]}(https://emodnet.ec.europa.eu/)
  - **Copernicus Marine Environment Monitoring Service (CMEMS):** Offers ocean data, including temperature, salinity, currents, and other parameters for marine planning. https://marine.copernicus.eu/
  - **GBIF (Global Biodiversity Information Facility):** Contains data on species distribution and presence at a global scale. [https://www.gbif.org/{]}(https://www.gbif.org/)
  - **OBIS (Ocean Biogeographic Information System):** A global archive of marine biodiversity data. [https://obis.org/{]}(https://obis.org/)
  - **ACCOBAMS (Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area):** Resources and data focused on cetacean conservation. [https://accobams.org/{]}(https://accobams.org/)
- **National and Regional:**
  - **National Geoportals:** Official GIS systems hosting data on marine and coastal areas, such as SINAnet in Italy or the Inspire Geoportal in Europe.
  - **National Marine Research Institutes:** Data from entities like ISPRA (Italy), Ifremer (France), and others.
  - **Regional Initiatives:** Local initiatives for coastal and marine management, such as Italy's National Cartographic Portal or data from MPA management consortia.
- **Non-Governmental and Open Data:**
  - **Global Fishing Watch:** Data on commercial fishing and maritime traffic to identify anthropogenic threats and pressures. [https://globalfishingwatch.org/{]}(https://globalfishingwatch.org/)
  - **OpenStreetMap (OSM):** Open-source cartographic data, including coastal elements and anthropogenic infrastructure. [https://www.openstreetmap.org/{]}(https://www.openstreetmap.org/)
  - **MarineTraffic:** Real-time ship tracking and maritime activity data. [https://www.marinetraffic.com/{]}(https://www.marinetraffic.com/)
  - **WWF Marine Initiative:** Maps and studies specific to marine habitats and sensitive areas. https://wwf.panda.org/
- **Specialized Resources:**

- **SeaDataNet:** European network for oceanographic and environmental data. [https://www.seadatanet.org/{]}(https://www.seadatanet.org/)
- **BlueHub (Blue Cloud Project):** Resources for marine modeling and collaborative science. [https://www.blue-cloud.org/{]}(https://www.blue-cloud.org/)
- **TNC Atlas (The Nature Conservancy):** Tools to identify conservation areas. https://maps.tnc.org/

7.1.2 Answers



Operational approaches

- *Participatory mapping* (Trade-off for MPA Design)

ESE3 - Trade-offs method for protections and restoration in MSP

Practices: *Monitoring and evaluation*

Operational approaches: *(Method) Participatory mapping*

References

- Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)
- Trade-offs method for protection and restoration in MSP (ESE3). Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).
- Integrated Ecological-Socio-Economic Management Framework - ESE Step-by-Step guidance (with test site examples and lessons learned). Deliverable D4.5 under under the WP4 of MSP4BIO project (GA n° 101060707). In preparation: expected July 2025.

7.2 Q 64 - How to deal with knowledge gaps on impacts of maritime activities, including cumulative impacts?

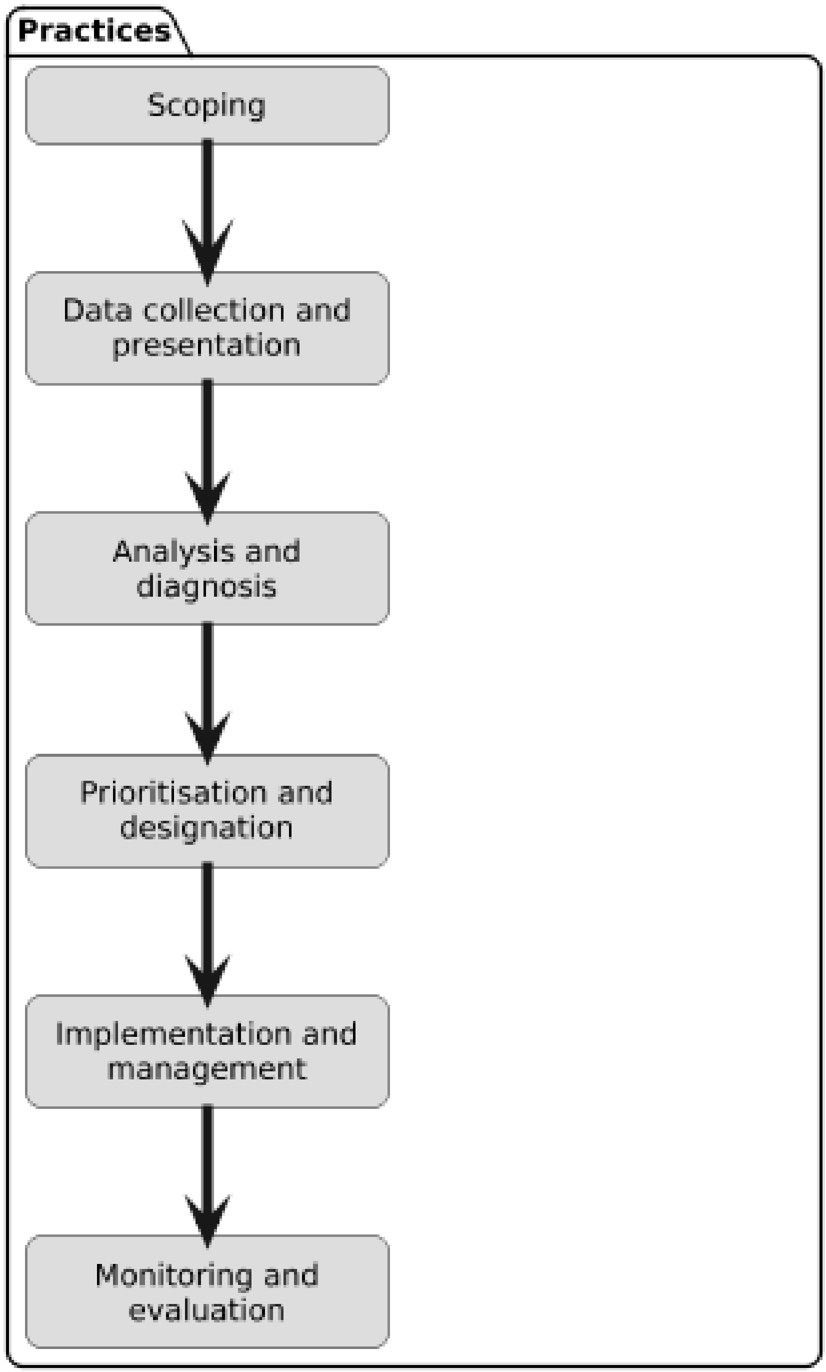
Broader "Question"

- *Q 61 - How can reliability/accuracy of the spatial data for MPA identification be improved?*

Related sites

- *Western Black Sea*

7.2.1 Answers



Operational approaches

- *Cumulative Effects Assessment (CEA)* (Cumulative Effects Assessment (CEA))
- *Tools4MSP CEA* (Cumulative Effects Assessment (CEA))
- *HELCOM SPIA Tool* (Cumulative Effects Assessment (CEA))
- *PlanWise4Blue* (Cumulative Effects Assessment (CEA))

- *Participatory mapping* (Trade-off for MPA Design)
- *EMODnet* (Data sharing)

ESE1 - Ecological toolkit

Practices: *Data collection and presentation Analysis and diagnosis*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Offshore zone

Operational approaches: *(Method) Cumulative Effects Assessment (CEA) (Tool) Tools4MSP CEA (Tool) HELCOM SPIA Tool (Tool) PlanWise4Blue (Method) Participatory mapping (Tool) EMODnet*

7.3 Q 63 - How to deal with knowledge gaps on socio-economic data, including the spatial dimension?

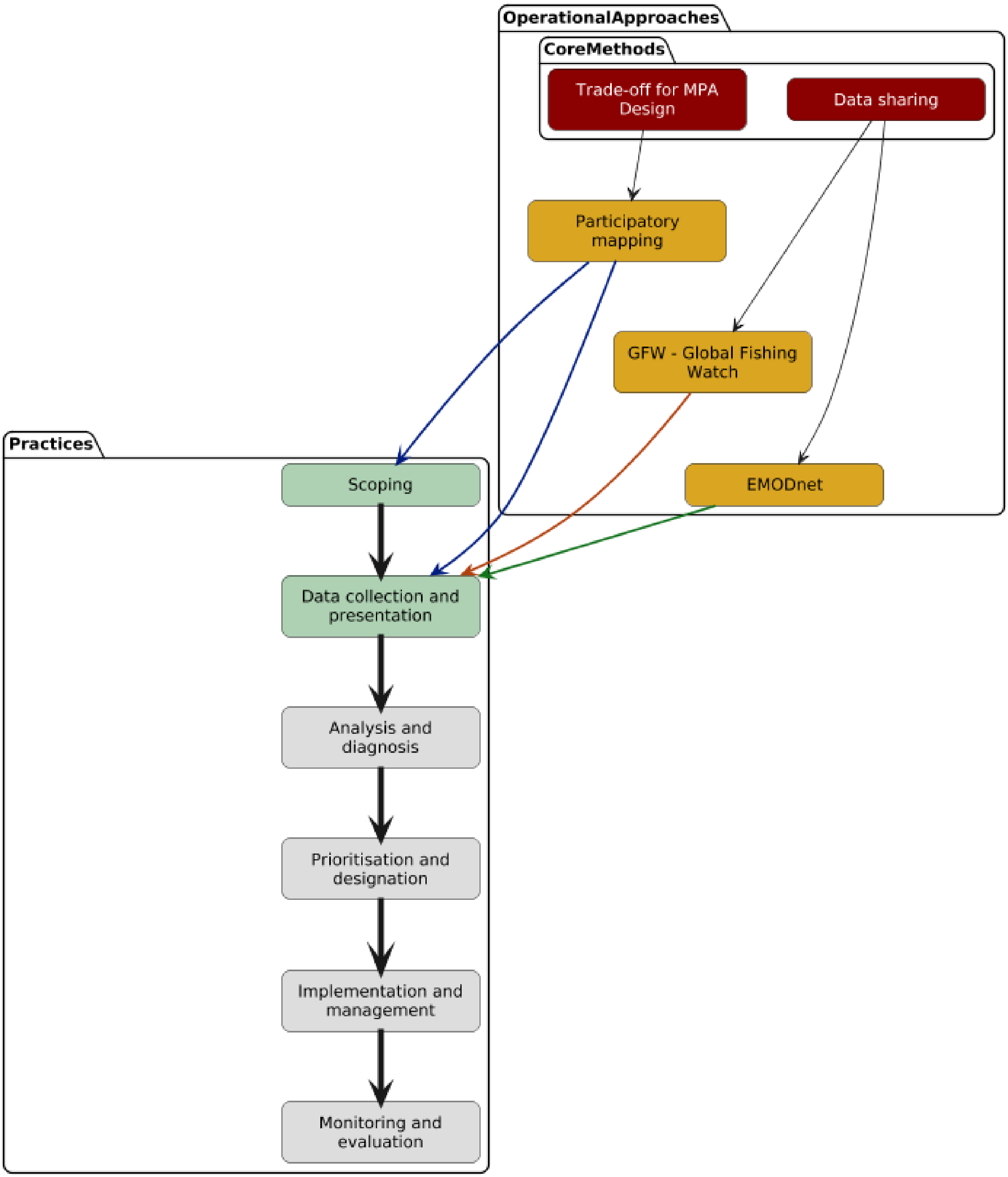
Broader "Question"

- *Q 61 - How can reliability/accuracy of the spatial data for MPA identification be improved?*

Related sites

- *Azores Archipelago*

7.3.1 Answers



Operational approaches

- *Participatory mapping* (Trade-off for MPA Design)
- *GFW - Global Fishing Watch* (Data sharing)
- *EMODnet* (Data sharing)

ESE2 - Criteria for the representation of the social and economic dimension of MPAs

Practices: *Data collection and presentation*
Spatial scales: Transboundary / sea basin National Regional / local

Marine zones: Coastal zone Offshore zone

Operational approaches: *(Tool) GFW - Global Fishing Watch (Tool) EMODnet*

Implementation details

Utilize a **multi-stage approach** to integrating limited Socio-Economic data.

Stage 1: Utilize Official Open Data Portals

The first step is to gather structured and authoritative datasets from official European and international sources, which provide standardized socio-economic indicators:

- EMODnet Human Activities - Spatial data on fishing, shipping, tourism, offshore energy, and aquaculture.
- Corine Land Cover (CLC) - European land cover data useful for assessing coastal development and changes.
- Eurostat - Statistics on coastal populations, employment, fisheries, and economic sectors.
- FAO Fisheries & Aquaculture - Global fisheries production, trade, and sustainability reports.

Stage 2: Integrate Data from NGOs and Research Institutions

Integrate data from NGOs, conservation organizations, and independent research projects, which often provide more detailed and real-time insights:

- OpenStreetMap (Overpass Turbo) <https://overpass-turbo.eu/>`_ - Extracting human activity patterns, infrastructure, and coastal land use data.
- Global Fishing Watch (GFW) - Real-time and historical fishing activity data.
- MarineTraffic (or other commercial services)- Ship tracking data for monitoring maritime traffic near MPAs.

Stage 3: Use Proxy Data to Fill Gaps

- **Nighttime Lights** (e.g., NASA VIIRS, NOAA DMSP-OLS) - Indicators of coastal development and fishing intensity.
- **AIS & VMS Tracking** (e.g., GFW, EU Fleet Register) - Mapping vessel activity to estimate fishing and shipping pressures.
- **Social Media Data** (e.g., Twitter, Instagram, Flickr APIs) - Assessing tourism and recreational activities in coastal areas.
- **Earth Observation** (e.g., Copernicus Sentinel, Landsat) - Identifying land use changes, coastal urbanization, and aquaculture sites.

ESE3 - Trade-offs method for protections and restoration in MSP

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone Deep sea Offshore zone

Operational approaches: *(Method) Participatory mapping*

Implementation details

Utilize Participatory Mapping: Engage local stakeholders through participatory mapping exercises to collect socio-economic data. This approach not only fills data gaps but also incorporates local knowledge and perspectives, enhancing the relevance and accuracy of the information gathered. Use of Annexe 5 - Table Participatory Mapping Tool. From Deliverable 4.3 “Trade-offs method for protection and restoration in MSP”

References

- Trade-offs method for protection and restoration in MSP (ESE3). Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

7.4 Q 62 - How to deal with knowledge gaps related to water column data to support establishment of conservation measures offshore?

Broader “Question”

- *Q 61 - How can reliability/accuracy of the spatial data for MPA identification be improved?*

Related sites

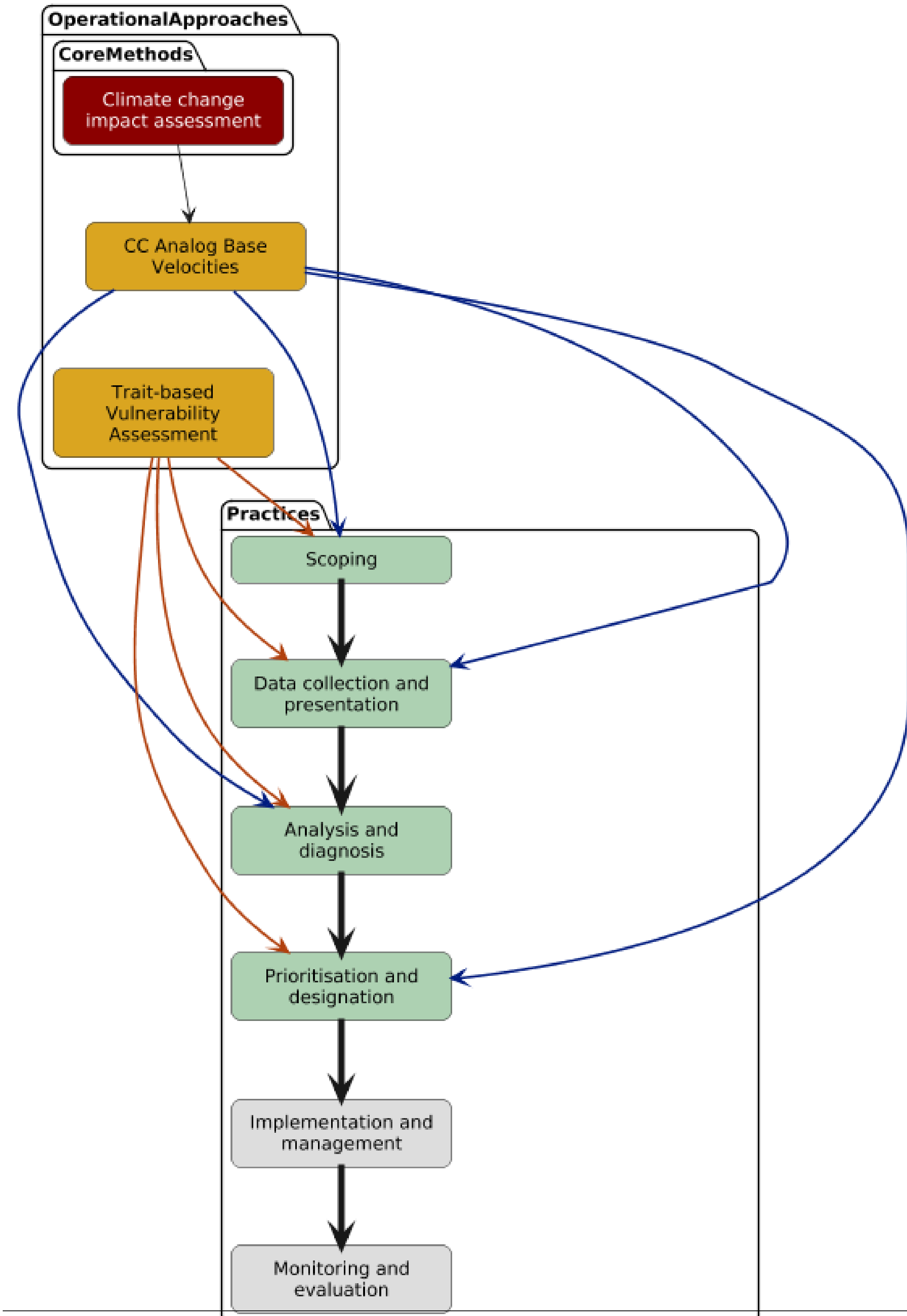
- *Azores Archipelago*

7.5 Q 65 - How can we assess CC impacts on fishing stocks (e.g. cod and sprat) and develop strategies to protect these species across different life stages (e.g. focusing on nurseries and fishing grounds)?

Related sites

- *Baltic Sea basin and Vistula Lagoon/Southern Baltic*

7.5.1 Answers


OperationalApproaches
CoreMethods
Climate change impact assessment
CC Analog Base Velocities
Trait-based Vulnerability Assessment
Practices
Scoping
Data collection and presentation
Analysis and diagnosis
Prioritisation and designation
Implementation and management
Monitoring and evaluation

Operational approaches

- *CC Analog Base Velocities* (Climate change impact assessment)
- *Trait-based Vulnerability Assessment* (Trait-based Vulnerability Assessment)

ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Non-strict protection
Marine zones: Offshore zone

Criteria classes: *1.1.1 Vulnerability 1.1.2 Stability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas 1.1.5 Climate-smart potential*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Stability*
    - Macro-criterion *Functional hotspots*
    - Macro-criterion *Life cycle critical areas*
    - Macro-criterion *Climate-smart potential*

Operational approaches: *(Tool) CC Analog Base Velocities (Method) Trait-based Vulnerability Assessment*

Implementation details

Considerations:

- The complexity of climate drivers and their interactions, requiring a multi-faceted approach to assess their impact on species biology.
- The necessity of integrating both ecological and anthropogenic data to provide a comprehensive analysis.
- The importance of identifying and protecting critical habitats, particularly nursery grounds, to ensure the resilience of fish populations under changing climate conditions.

Methodological framework

A. **Ecological and climate data integration**

1. **Ecological considerations:**
   ◦ Utilize existing ecological data on species distribution, critical habitats, and biological thresholds for various climatic stressors (e.g., temperature, salinity) relevant to cod and sprat. ◦ Incorporate nursery and reproductive areas into the analysis to ensure the protection of these critical life stages. ◦ Assess potential habitat loss under different climate scenarios, focusing on short-term (2030), mid-term (2050), and long-term projections.

2. **Climate Data Utilization:**
   ◦ Use climate projection tools and available databases (like Bio-Oracle and HELCOM database) to obtain data on sea surface temperature (SST), sea surface salinity (SSS), and other relevant parameters under different SSP scenarios. ◦ Identify potential overlaps between current species distributions and future climatic conditions, focusing on areas where climatic conditions might exceed biological thresholds for stress or mortality.

B. Fisheries management integration

1. Fishing pressure analysis:

- Analyze fishing pressure data (i.e., fishing intensity data provided by ICES) and projected ecological changes to identify areas where fishing may need to be restricted or adapted due to adverse climatic conditions.
- Calculate the percentage of current fishing areas that might be lost due to climate-driven changes in species distributions and abundance.

2. Scenario development:

   - **Scenario 1: Progressive closure of areas:**
     ▪ Prioritize areas for protection based on ecological integrity, focusing on the stability of critical habitats like nursery grounds under climate change. ▪ Integrate trophic relationships and prey availability into the analysis to ensure the overall ecosystem's resilience.
   - **Scenario 2: Transitioning fishing targets:**
     ▪ Explore the potential for transitioning fishing activities towards species more resilient to climate change, such as small pelagics like sprat. ▪ Consider the emergence of new species in the Baltic Sea under future climatic conditions and evaluate their potential as new fishing targets.

Discussion points for further development

- The need for a more detailed analysis of the prey-predator relationships between cod and sprat, and how these interactions might shift under climate change.
- The importance of validating the proposed approach with climate specialists (Joint HELCOM/Baltic Earth Expert Network on Climate Change) familiar with the Baltic Sea to ensure the robustness of projections and stress thresholds.
- The potential for integrating additional climate drivers, such as deoxygenation and acidification, into the analysis framework for a more comprehensive understanding of long-term impacts.

7.6 Q 24 - How do MPA policies intersect with MSP?

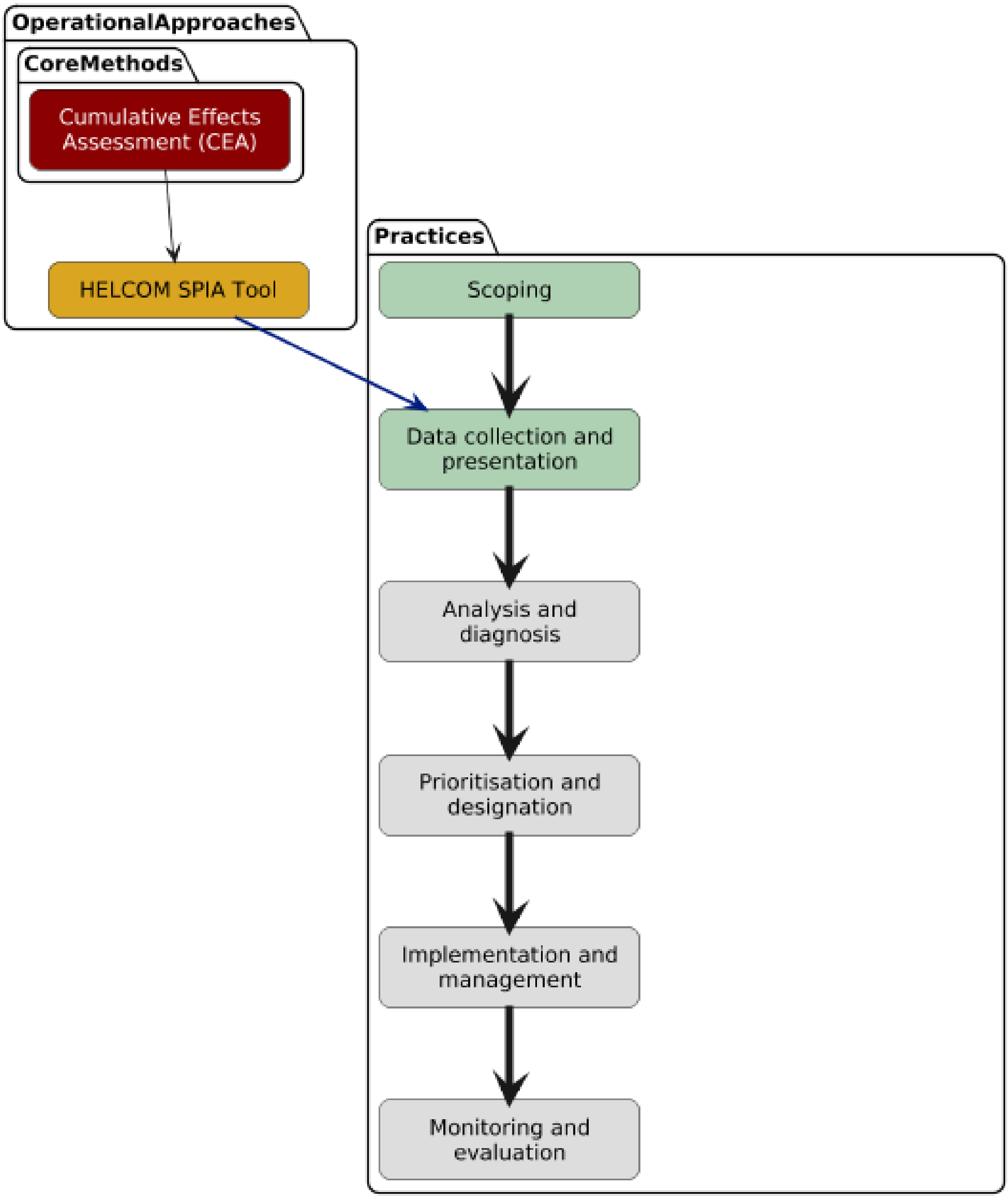
Narrower "Questions"

- *Q 25 - How to integrate the process of MPA designation or extension in MSP?*

Related sites

- *Baltic Sea basin and Vistula Lagoon/Southern Baltic*

7.6.1 Answers



Operational approaches

- *HELCOM SPIA Tool* (Cumulative Effects Assessment (CEA))

Policy solutions

Practices: *Data collection and presentation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Criteria

- Category *Socio–economic & governance criteria*
  - Subcategory *Socio–economic criteria*
    - Criteria *Area important because it allows access to relevant areas for the marine users.*
    - Criteria *Area important for locally-caught seafood*
    - Criteria *Area important for the generation of employment and income linked to non traditional activities*
    - Criteria *Area important for fishery activity*
    - Criteria *Area important for dredging*
    - Criteria *Area important because of the presence of structure with significant historical and cultural. (mo*
    - Criteria *Area of high scientific interest*
    - Criteria *Area important for educational interest*
    - Criteria *Area important because of the occurrence of iconic species/habitats for the local community*
    - Criteria *Area important for thehealth of coastal residents and/or resource users (mental health, physical hea*
    - Criteria *Area important due to the socio-cultural dependence of the coastal community with its environ*
    - Criteria *Area important to be managed due to the presence ofspatial conflicts among users*
    - Criteria *Area important because of the presence of cultural symbolic value*
    - Criteria *Area important for recreation and leisure*
    - Criteria *Area important because of the presence of cultural and tradition activities that support local fo*
    - Criteria *Area important for traditional human settlement, land-use, or sea-use which is representative of*
    - Criteria *Area with high scenic and/or aesthetic value*
    - Criteria *Area important for shipping*
    - Criteria *Area is important for the development of blue economy activities*
    - Criteria *Area with current/potential importance to explore and demonstrate approaches and management solution*
  - Subcategory *Governance criteria*
    - Criteria *Equity*

* Criteria *Clear strategic plan for the development of sustainable blue economy*
* Criteria *Cross-border cooperation*
* Criteria *Decision making is based on best information and knowledge available*
* Criteria *Strategic Environmental Assessment*
* Criteria *Monitoring and evaluation*
* Criteria *Instruments to ensure and guide development and implementation of marine policies*
* Criteria *Sustainable fishing management*
* Criteria *Climate change measures established*
* Criteria *Ecosystem based management approach*
* Criteria *Long term strategic adaptive management*
* Criteria *Coherence management of the area*
* Criteria *Stakeholder participation*

Operational approaches: *(Tool) HELCOM SPIA Tool*

Implementation details

From an ecological perspective, MSP and MPAs share common objectives aligned with international legal frameworks such as the IUCN and the Barcelona Convention. Notably, the Global Biodiversity Framework identifies marine spatial planning as a key tool to mitigate biodiversity loss. Furthermore, the planning processes and methodologies for MSP and MPA management are similar, although they often operate on different spatial scales. Importantly, much of the knowledge applied in MSP processes is derived from MPAs, which have been central for marine environmental studies for decades, accumulating extensive experience in regulatory implementation and monitoring. In the EU, MPAs are governed by several key policies and regulations designed to protect marine biodiversity and address environmental challenges. In particular, the Habitats Directive (92/43/EEC) and the Birds Directive (2009/147/EC) provide a foundation for conservation efforts. Complementing these, the Marine Strategy Framework Directive (MSFD) (2008/56/EC) promotes an ecosystem-based approach (EBA) to achieve „Good Environmental Status" (GES) for EU marine waters. Similarly, the EU Biodiversity Strategy for 2030 sets an ambitious target to protect at least 30% of the marine environment by 2030. The Marine Spatial Planning Directive (MSPD) integrates biodiversity conservation into its framework by requiring Member States to apply an EBA in their maritime spatial plans. However, the MSPD lacks a clear definition of EBA and does not provide guidelines for its application, which may result in inconsistent implementation across countries. The directive emphasizes the need to "preserve, protect, and improve the environment, including resilience to climate change impacts" (Article 5) and allows Member States to consider "nature and species conservation sites and protected areas" (Article 8). Nevertheless, while the MSPD mandates monitoring of its implementation, it does not explicitly require an assessment of the effectiveness of maritime spatial plans in achieving biodiversity objectives.

Policy solutions

Practices: *[Not Related to Any Practice]*

Policy soutions: *Establishing a dedicated coordination framework for marine biodiversity*

7.7 Q 25 - How to integrate the process of MPA designation or extension in MSP?

Broader "Question"

- *Q 24 - How do MPA policies intersect with MSP?*

Narrower "Questions"

- *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
- *Q 26 - How to take OECM into consideration in MSP where no legal instruments are in place?*

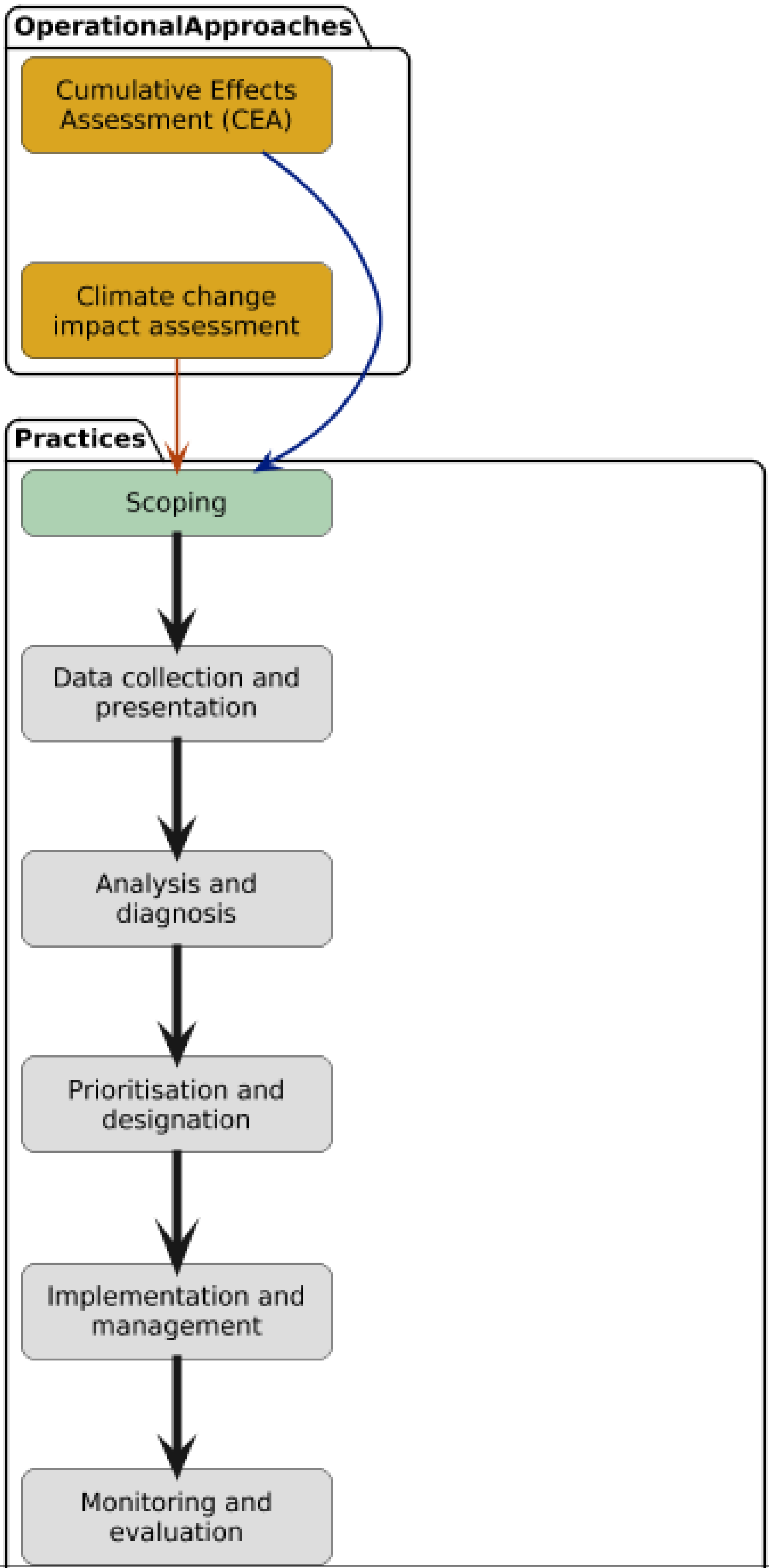
Related sites

- *Baltic Sea basin and Vistula Lagoon/Southern Baltic*
- *Western Black Sea*
- *Azores Archipelago*

7.7.1 General answer

MSP should consider biodiversity and ecosystem protection as overarching objective and state this clearly in the vision (MSP Stage 2: "Assessing the context and defining a vision"). When "Analyzing existing and future conditions" (MSP Stage 3) the present level of protection and its effectiveness should be considered (existing MPAs, their management, the protection results achieved), as well as the occurrence of areas that should be protected (with reference to specific habitats or species). A spatial assessment of cumulative effects of anthropogenic pressures can support the identification of the areas most affected. Future scenarios of protection needs should be elaborated with the support of modelling tools, to consider changes linked to climate and use trends. Such analysis should support the identification of areas to be protected due to their value under future conditions (e.g. climate refugia). Candidate areas for new MPAs or for their extension should be identified. New MPA designation or their extension should be "Identified as a key issue" (MSP stage 4) for the plan. From a governance point of view, it is crucial to coordinate this process with the national process of MPA designation, in the case the latter is under the responsibility of a different authority. When "Elaborating the plan" (MSP Stage 5) the new MPAs should be designed and integrated in the system of uses of the area. The uses in the area, particularly in the surroundings of the MPA, should be managed in a way to keep the anthropogenic pressures under control and ensure functioning of MPA measures. Discussion of the implications of the extension of protection measures in the area should be discussed with stakeholders: trade-off methods can be applied.

7.7.2 Answers


OperationalApproaches
Cumulative Effects Assessment (CEA)
Climate change impact assessment
Practices
Scoping
Data collection and presentation
Analysis and diagnosis
Prioritisation and designation
Implementation and management
Monitoring and evaluation

Operational approaches

- *Cumulative Effects Assessment (CEA)* (Cumulative Effects Assessment (CEA))
- *Climate change impact assessment* (Climate change impact assessment)
- *Trade-off for MPA Design - Conservation and economic development* (Trade-off for MPA Design)

ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: National Regional / local
Protection regimes: Strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Operational approaches: *(Method) Cumulative Effects Assessment (CEA) (Method) Climate change impact assessment*

MSPdF Classification: *Marine & Coastal Environment -> Ecosystem: Species Marine & Coastal Environment -> Ecosystem: Habitat Marine & Coastal Environment: Pressure Marine & Coastal Conservation and Designated sites Maritime Activities and MSP Legal, Governance & Planning: Conservation (i.e. Protected areas) Legal, Governance & Planning: Who is in charge?*

ESE3 - Trade-offs method for protections and restoration in MSP

Operational approaches: *(Method) Trade-off for MPA Design - Conservation and economic development*

7.8 Q 27 - Are there good practices of MPA-MSP integration in terms of governance?

Broader "Question"

- *Q 25 - How to integrate the process of MPA designation or extension in MSP?*

Related sites

- *Baltic Sea basin and Vistula Lagoon/Southern Baltic*

7.8.1 General answer

To achieve effective integration of MPAs and MSP at the governance level, it is essential to: • Establish a policy framework ensuring alignment of MPA objectives with broader MSP frameworks to avoid conflicts. • Foster coordination and cooperation between authorities managing MPAs and those responsible for MSP. • Develop mechanisms for sectoral collaboration to integrate MPA goals into broader maritime planning frameworks across all sectors. • Facilitate information sharing between MPA management and MSP authorities to ensure decisions are based on consistent and up-to-date data.

Practically, integration between conservation (MPA planning and management) and MSP can be observed on 3 different levels:

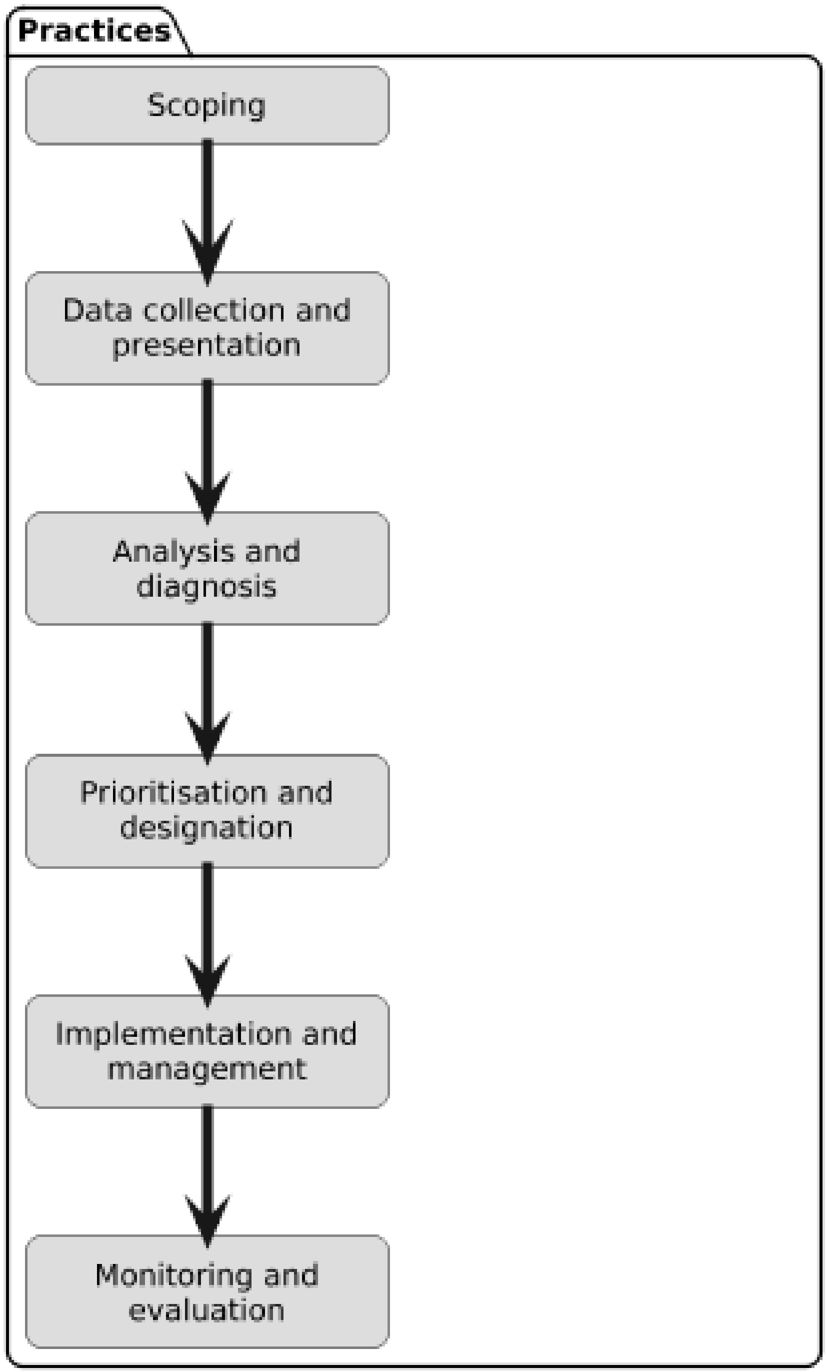
1. Conservation is the driver for MSP Some of the examples for this type of integration include those of the Great Barrier Reef Marine Park and Seychelles Marine Spatial Plan. For example, the Seychelles Marine Spatial Plan (MSP) was developed with the goal of designating 30% of its Exclusive Economic Zone (EEZ) as Marine Protected Areas (MPAs) under a debt-for-nature swap agreement. Conservation objectives were prioritized, with the MSP serving as a tool to integrate various marine uses and manage potential conflicts, such as those between fishing and tourism. The MPA

designations within the MSP include no-take zones, where all extractive activities are prohibited, conservation zones, focused on protecting critical ecosystems like coral reefs and seagrass beds and sustainable-use zones, where regulated fishing and other activities are permitted. To operationalize the plan, a collaborative governance model was established, engaging government agencies, conservation NGOs, and local stakeholders to balance conservation priorities with the socio-economic needs of local communities.

2. Conservation is integrated into MSP across sectors The Belgian MSP promotes conservation as an active component of a balanced, multi-use marine system. Its long-term vision “prioritises naturalness as a basic precondition, and is therefore based primarily on the protection of the most ecologically valuable areas by delimiting marine protected areas with effective management measures.” Conservation is integrated within sectors, such as fisheries, by reducing harmful practices, minimizing pollution risks, and preventing habitat disturbance. However, conservation is particularly prioritized in areas already designated as MPAs, including Natura 2000 sites. In other areas, conservation depends on the sector and the specific regulatory measures in place. In such cases, careful planning and coordination ensure that conservation objectives are met, especially for activities that could harm sensitive ecosystems or MPAs. Similarly, conservation is integrated across sectors in Sweden’s MSP through an ecosystem-based approach that prioritizes sustainable use and biodiversity protection. For example, in the Bothnian Sea MSP, offshore wind farms are strategically located away from sensitive seabed habitats, and fishing zones are adjusted to minimize impacts on spawning areas for herring.

3. Other forms of integration include incorporating conservation through Strategic Environmental Assessments (SEA), which involve detailed analysis of ecological values and functions, and/or positioning MPAs as a key layer within the MSP. These approaches are common in most EU MSPs.

7.8.2 Answers



Operational approaches

- *Trade-off for MPA Design* (Trade-off for MPA Design)
- *Trade-off for MPA Design - Conservation and economic development* (Trade-off for MPA Design)
- *Trade-off for MPA Design - Short-term and long-term benefits* (Trade-off for MPA Design)
- *Trade-off for MPA Design - Exclusives uses and shared uses* (Trade-off for MPA Design)

- *Trade-off for MPA Design - Specific stakeholder interests* (Trade-off for MPA Design)
- *Trade-off for MPA Design - Local and global interests* (Trade-off for MPA Design)
- *Participatory mapping* (Trade-off for MPA Design)

ESE3 - Trade-offs method for protections and restoration in MSP

Practices: *[Not Related to Any Practice]*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Operational approaches: *(Method) Trade-off for MPA Design (Method) Trade-off for MPA Design - Conservation and economic development (Method) Trade-off for MPA Design - Short-term and long-term benefits (Method) Trade-off for MPA Design - Exclusives uses and shared uses (Method) Trade-off for MPA Design - Specific stakeholder interests (Method) Trade-off for MPA Design - Local and global interests (Method) Participatory mapping*

7.9 Q 26 - How to take OECM into consideration in MSP where no legal instruments are in place?

Broader "Question"

- *Q 25 - How to integrate the process of MPA designation or extension in MSP?*

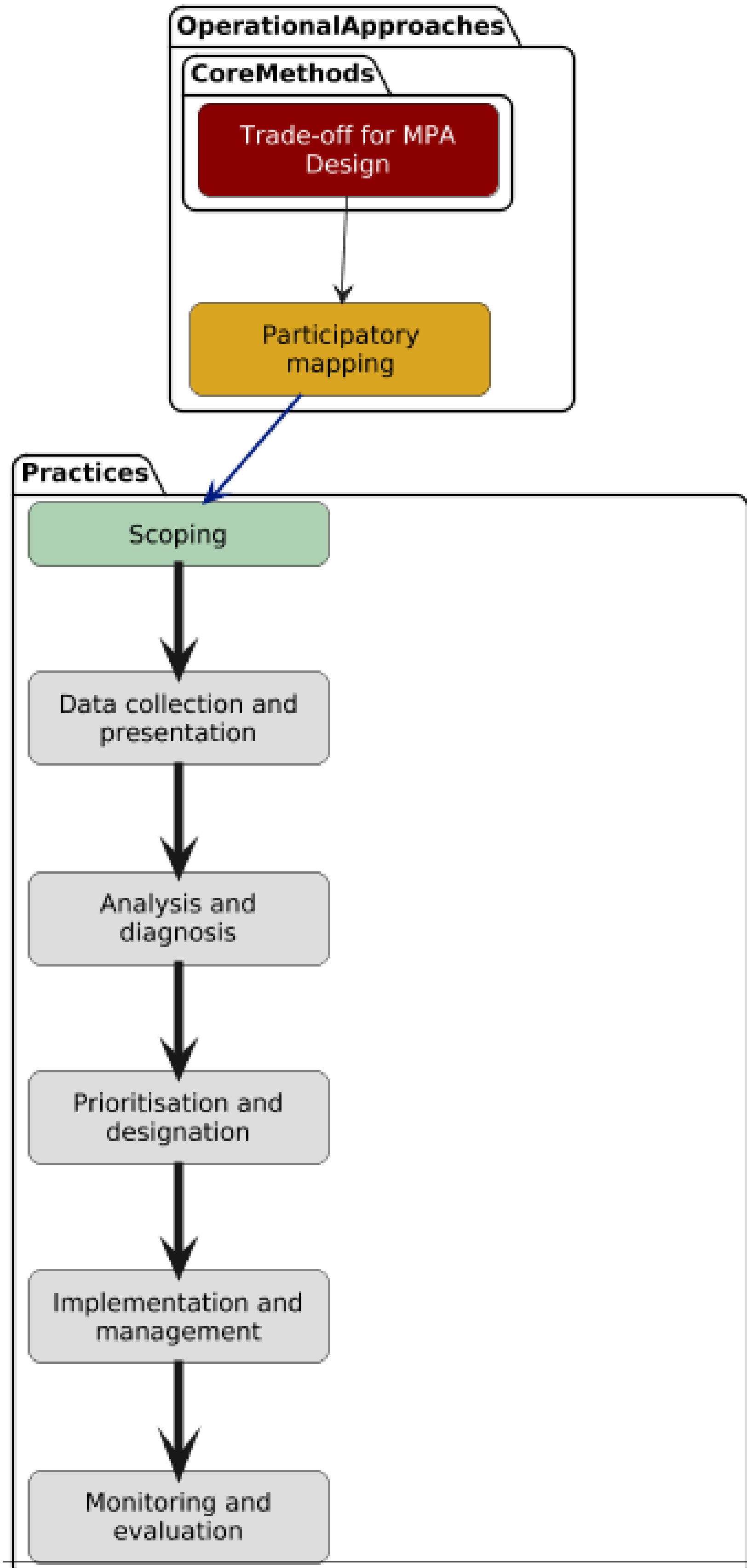
Related sites

- *Azores Archipelago*

7.9.1 General answer

While protected areas must have a primary conservation objective, this is not necessary for OECMs. OECMs may be managed for many different objectives but they must deliver effective conservation. They may be managed with conservation as a primary or secondary objective or long-term conservation may be the ancillary result of management activities. Recognition of OECMs offers a significant opportunity to recognise de facto effective long-term conservation that is taking place outside currently designated protected areas under a range of governance and management regimes, implemented by a diverse set of actors, including by indigenous peoples and local communities, the private sector and government agencies. Identifying, reporting, monitoring and strengthening OECMs offers a significant opportunity to promote and support de facto effective long-term conservation that is in addition to that provided by designated protected areas. Like protected areas, OECMs can occur under a range of governance regimes, including those of Indigenous peoples and local communities, the private sector and government agencies. IUCN has published a Good Practice Guidance on other effective area-based conservation measures (OECMs) https://portals.iucn.org/library/node/51773 These guidelines are designed to promote good practices relating to identifying, reporting, monitoring and strengthening OECMs. They are intended for use by a wide range of rightsholders and stakeholders to promote understanding of whether a site meets the CBD criteria for identifying an OECM, how to report OECM data at the national and global levels, and how to monitor and strengthen OECMs. Recognition as an OECM may also provide additional incentives for conservation and sustainable management of areas of biodiversity significance outside protected areas, such as Key Biodiversity Areas (KBAs), Important Plant Areas (IPAs), Important Bird Areas (IBAs), Important Marine Mammal Areas (IMMAs), and Ecologically or Biologically Significant Marine Areas (EBSAs), noting that such areas must meet the definition of an OECM to be included.

7.9.2 Answers



OperationalApproaches
CoreMethods
Trade-off for MPA Design
Participatory mapping
Practices
Scoping
Data collection and presentation
Analysis and diagnosis
Prioritisation and designation
Implementation and management
Monitoring and evaluation

Operational approaches

- *Participatory mapping* (Trade-off for MPA Design)

ESE3 - Trade-offs method for protections and restoration in MSP

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone Deep sea Offshore zone

Operational approaches: *(Method) Participatory mapping*

Implementation details

The following approaches can be beneficial: 1. **Stakeholder Engagement**: Actively involve local communities and stakeholders in planning to gather insights on existing conservation practices that may already be functioning informally. Participatory mapping techniques can enhance engagement and ensure that local knowledge is integrated into the planning framework (pages 20, 21) 2. **Flexible Frameworks**: Develop flexible governance structures that allow for adaptive management of marine areas based on emerging conservation needs and stakeholder perspectives. This can facilitate the recognition of OECMs in regions that may not currently have formal protections (page 36). 3. **Valuation of Ecosystem Services**: Assess and value ecosystem services provided by marine environments to illustrate their importance for conservation and local livelihoods. This understanding can help build a case for implementing OECMs to balance ecological sustainability with economic activities (pages 22, 24). 4. **Identification and Mapping of Potential OECMs**: Utilize technology and participatory mapping to identify areas that may serve as OECMs. By involving stakeholders in the mapping process, you can capture areas of ecological or cultural significance that warrant consideration for conservation outside formal legal frameworks (page 21). 5. **Adopting Integrated Management Approaches**: Incorporate adaptive and integrated management strategies within MSP, considering the interconnections between conservation, economic development, and social structures. This holistic approach can facilitate the inclusion of OECMs within broader spatial planning efforts ((page 36).

Notes

Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

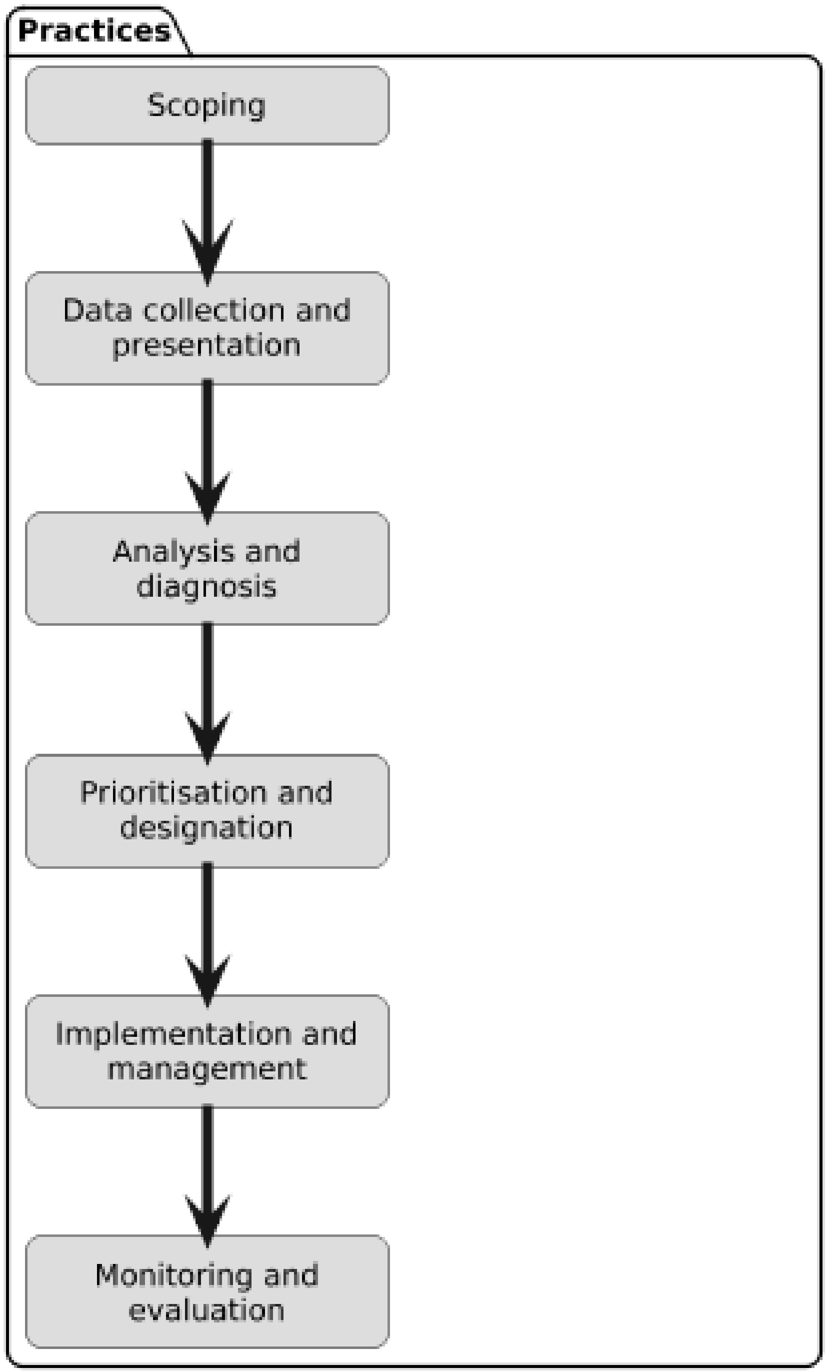
Policy solutions

7.10 Q 34 - How to achieve the strict protection area target of 10% by 2030 in marine areas?

Related sites

- *North-Western Mediterranean (NW-MED)*

7.10.1 Answers



Operational approaches

- *Dispersion and connectivity modelling* (Dispersion and connectivity modelling)
- *Climate change impact assessment* (Climate change impact assessment)
- *Participatory mapping* (Trade-off for MPA Design)
- *Data sharing* (Data sharing)

ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: National
Protection regimes: Strict protection
Marine zones: Coastal zone Offshore zone

Criteria classes: *1.1 Functional 1.3 Genetic 1.4 Ecological status*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
  - Subcategory *Genetic*
  - Subcategory *Ecological status*

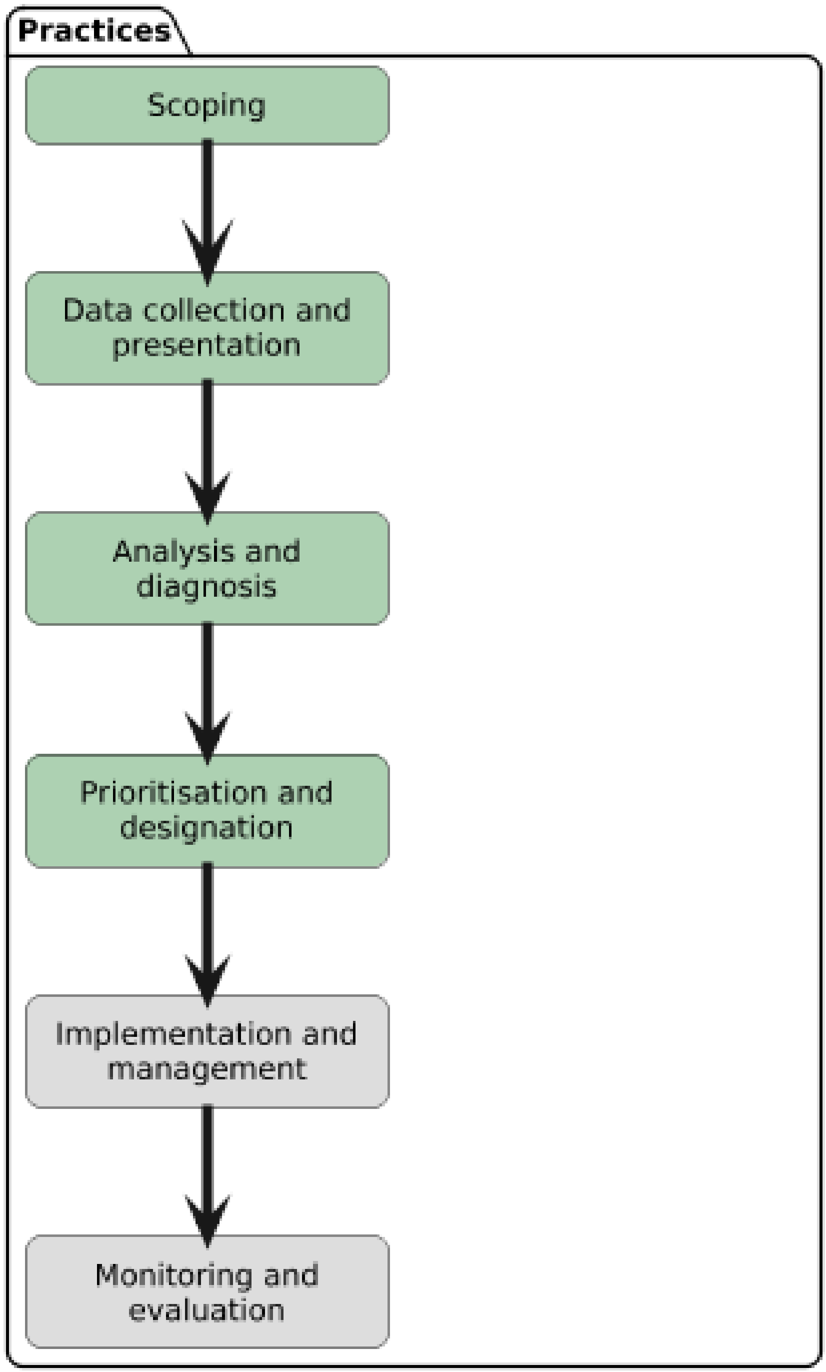
Operational approaches: *(Method) Dispersion and connectivity modelling (Method) Climate change impact assessment (Method) Participatory mapping (Method) Data sharing*

7.11 Q 38 - How to address ecological functionalities in conservation objectives?

Related sites

- *North-Western Mediterranean (NW-MED)*

7.11.1 Answers



ESE1 - Ecological toolkit

Practices: *Scoping*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Criteria classes: *1.1 Functional*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*

Implementation details

How to address ecological functionalities in conservation objectives?

Conservation objectives should focus on identifying, monitoring and protecting areas where species and habitats that are important from a functional point of view are present. Macro-criterion (D3.4) Functional hotspots consists of several criteria useful in this regard, such as functionally representative areas, food web structure, presence of key functional species and key functional areas. In addition, and especially for functionally important species such as mobile apex predators that require connectivity between areas, these critical areas offering developmental, foraging, refuge, nursery grounds, recruitment and larval sources/spawning aggregation, should be considered as the status of life cycle critical areas, whether located within or outside of an area of interest, remain a key aspect of protecting species. Conservation objectives must also remain flexible to change as climate change can cause distributional shifts of functionally important species and establish and integrate a list of adaptive and highly resilient species (e.g. adaptivity potential and low vulnerability species). Lastly, criteria ecosystem integrity and stability should be addressed in conservation objectives, with functionally important species and habitats that contribute to this stability and integrity at broad scales, included in the drafting and implementation of objectives.

7.12 Q 47 - How to address the different scales of management (MSP-MPA) in an ESE framework?

Related sites

- *Gulf of Cadiz*

7.12.1 General answer

Multiscalar approach in MSP Based on the characteristics of the sea space under national jurisdiction (e.g. dimensions, geographic features, intensity of uses, presence of vulnerable areas, synergies between uses) national MSP authorities may adopt a multi-scalar approach to MSP and prepare distinct plans for different marine areas. This approach includes a variety of situations: different areas can spatially overlap or not; different plans can be under the responsibility of the same or different authorities, and there can be a hierarchical relationship between plans. When a multi-scalar approach is applied to areas covered by plans at different levels (e.g. a national overarching plan for the entire sea space and sub-plans for some sub-areas included in this space), this is also referred to as a nested approach. A crucial step under a multi-scalar approach to MSP is the identification of hotspot areas for which small scale plans are needed. Geographical features (bays, lagoon, straits, island waters), distribution of maritime activities (high concentration of uses of the sea), ecosystem vulnerability (hotspots of biodiversity, nursery / recovery areas for natural populations) are all possible criteria. To effectively implement

MSP under a multi-scalar approach the following elements should be taken into accout: • Building a multi-level governance scheme for MSP and management, covering the national to the local level (vertical integration) and across different local levels (horizontal integration) • Connecting governance and management schemes in order to ensure consistency to the implementation and monitoring of the system of plans developed. • Finding agreement across government agencies with competing and sector-driven views on the marine domain.

Ref. Bocci M. & Ramieri R., 2018. Workshop Briefing Paper Maritime Spatial Planning in Small Sea Spaces https://maritime-spatial-planning.ec.europa.eu/events/workshop-msp-small-sea-spaces

7.13 Q 54 - How to anticipate and address climate change within MPA?

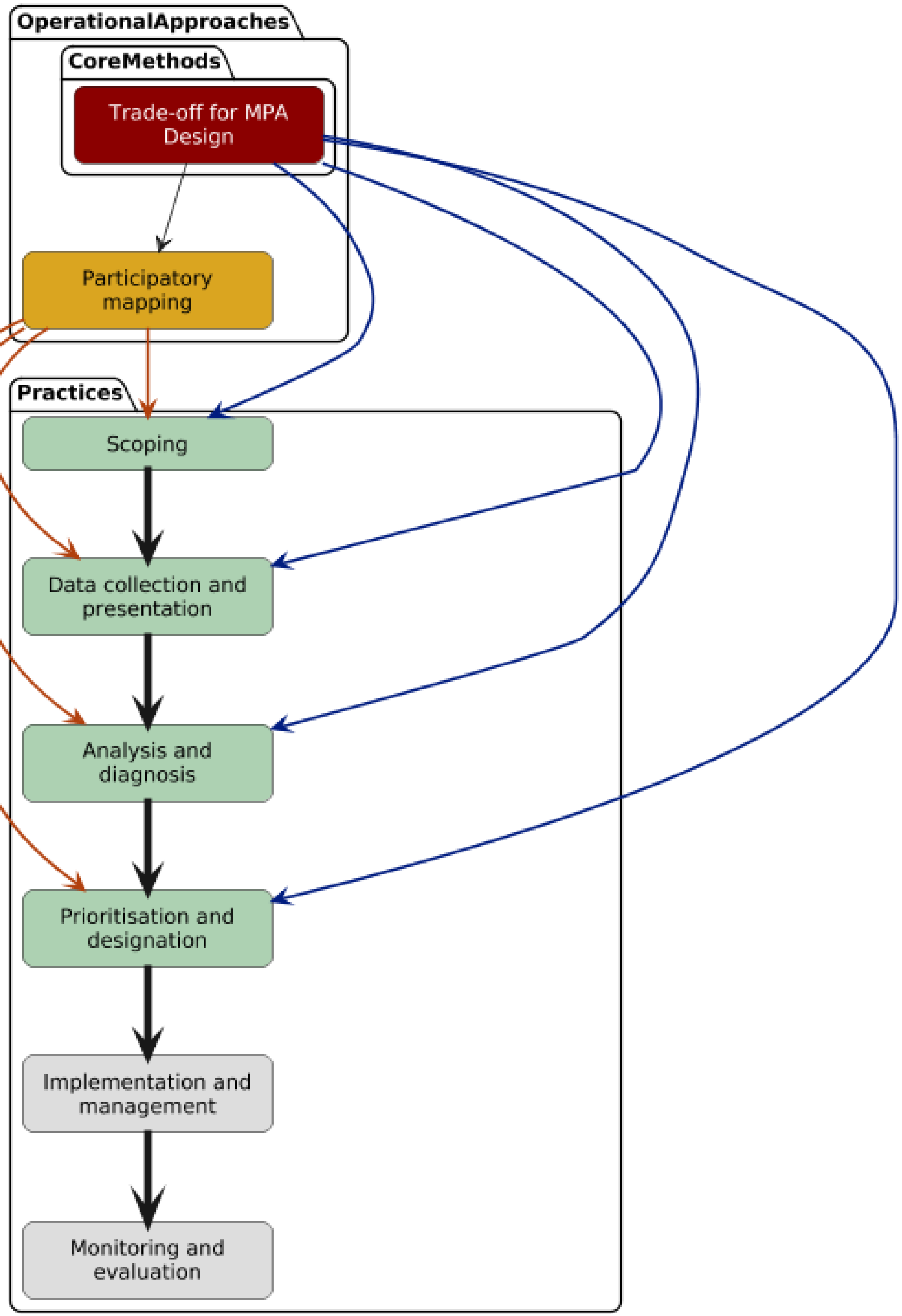
Narrower "Questions"

- *Q 55 - How to anticipate and address climate change within a MPA network?*

Related sites

- *Baltic Sea basin and Vistula Lagoon/Southern Baltic*

7.13.1 Answers



Operational approaches

- *Trade-off for MPA Design* (Trade-off for MPA Design)

- *Participatory mapping* (Trade-off for MPA Design)

ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Criteria classes: *1 Ecological and genetic criteria 1.1 Functional 1.1.1 Vulnerability 1.1.2 Stability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas 1.1.5 Climate-smart potential 1.2 Structural*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    * Macro-criterion *Vulnerability*
    * Macro-criterion *Stability*
    * Macro-criterion *Functional hotspots*
    * Macro-criterion *Life cycle critical areas*
    * Macro-criterion *Climate-smart potential*
  - Subcategory *Structural*

Implementation details

To anticipate and address climate change within an MPA, it is necessary to define and model future probable scenarios inside the MPA and perform a risk assessment based on each of these scenarios. The MSP4BIO climate-related guidance is dedicated to support managers in this process (CAMBRA et al., 2024) and as such we highly recommend to read it carefully and use it as a basis for analysis. To perform the analysis, ensure to be supported by a modeler.

Different key components need to be integrated to answer this question:

Anticipation: The anticipation of CC incidence on a given MPA: initiate by evaluating the climate risk inside MPA boundaries. Here are presented different solutions according to the level of expected complexity and the knowledge level. 1. Anomalies assessment: in this case, only the physical component is used to evaluate the existence and potential intensity of CC incidence inside the area. 2. Climate velocities: climate velocities analysis are particularly suitable to integrate connectivity and species movements induced by climate change. Nevertheless it aims to integrate projections in a broader area than a single MPA or when regarding species, to establish a list of species of prior interest as it is particularly time and data-consuming to project velocities for the whole ecosystem. Performing species-based vulnerability assessment could support the selection process. 3. Species-based vulnerability assessment: if the framework of the analysis is limited to some species previously selected because of their ecological importance (functions, services related to criteria: food web structure, etc…), their supposed sensitivity/interest (e.g., adaptivity potential) under CC or because of the management plan of the MPA (e.g., flagship species), a vulnerability assessment could be particularly interesting to evaluate potential future trends for the species per se (movement, stress, maintenance…) and as such highlight some management priorities.

All these methods are presented and developed in the chapter 3, Section 3.2.4.1 "Methods for climate exposure assessment" (CAMBRA et al., 2024). For vulnerability assessment and prioritization exercise, we highly recommand to refer to Table 2 (chapter 2.5) and chapter 4. They will provide some future scenarios to create a scenarios portfolio that will support any MPA decision process to address climate change effects.

Addressing climate-change inside the MPA depends on the objectives that the MPA (promote adaptation, mitigation…) which depends on the MPA location and climate potential, but also until what level the MPA could integrate climate in their management priorities. A list of types of areas and a presentation of scenarios can be found in CAMBRA et al., 2024, chapter 5.1 and more generally in chapter 5. Each of these climate-smart MPAs are defined by flagship species and MPA priorities. A list of climate-smart criteria for MPA and MPA networks can be found in chapter 6 to support MPA transition towards more climate-smart designs and management according to the current state of knowledge.

There are also good practices that need to be promoted such as developing a dedicated monitoring inside the area and promoting collaboration with adjacent MPAs to ensure the early recognition of environmental changes and share experiences and responsibilities between MPAs, as they don't share the same role, importance or have the same potential when facing climate regulation.

Criteria that can be useful in answering this question are: 1.1.1 Vulnerability - Traits-based Adaptivity, Sensitivity, Resilience/Recovery, Resistance, Species Vulnerability to Climatic and Anthropogenic stressors 1.1.2 Stability - General Adaptivity, Redundancy 1.1.3 Functional hotspots - Food web structure, Presence of key functional species, Key functional areas 1.1.4. Life cycle critical areas - Refuge area 1.1.5 Climate-smart potential - Concentrative Potential of Species of interest, Potential for mitigation, Potential for Adaptation, Connectivity Potential, Climatic stability

Notes

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n°101060707)

ESE3 - Trade-offs method for protections and restoration in MSP

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone Deep sea Offshore zone

Operational approaches: *(Method) Trade-off for MPA Design (Method) Participatory mapping*

Implementation details

Several strategies can be implemented:

1. **Incorporate Climate Projections**: Integrate climate change scenarios into spatial conservation plans, as outlined in the guidelines produced by Deliverable 4.3. This enables planners to consider potential future changes and develop resilient strategies (page 14).
2. **Participatory Mapping**: Engage stakeholders in participatory mapping exercises to assess local perceptions of climate change. This involvement can help identify vulnerable areas and ecosystem services impacted by climate variability, ensuring that local knowledge informs management decisions (pages 21, 32).
3. **Ecosystem Services Assessment**: Value and assess the ecosystem services provided by marine environments to understand their role in mitigating climate impacts. This understanding aids in developing conservation strategies that safeguard these services while supporting community needs (page 23).
4. **Scenario Development and Trade-Off Analysis**: Create scenarios reflecting various trade-offs between conservation and economic activities, incorporating stakeholder feedback to balance ecological preservation and socio-economic development (page 24).

5. **Adaptive Management**: Implement adaptive management practices that allow for flexibility in response to new information and changing conditions resulting from climate change. This approach encourages continuous monitoring and modification of management strategies (page 21).

Notes

Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

7.14 Q 55 - How to anticipate and address climate change within a MPA network?

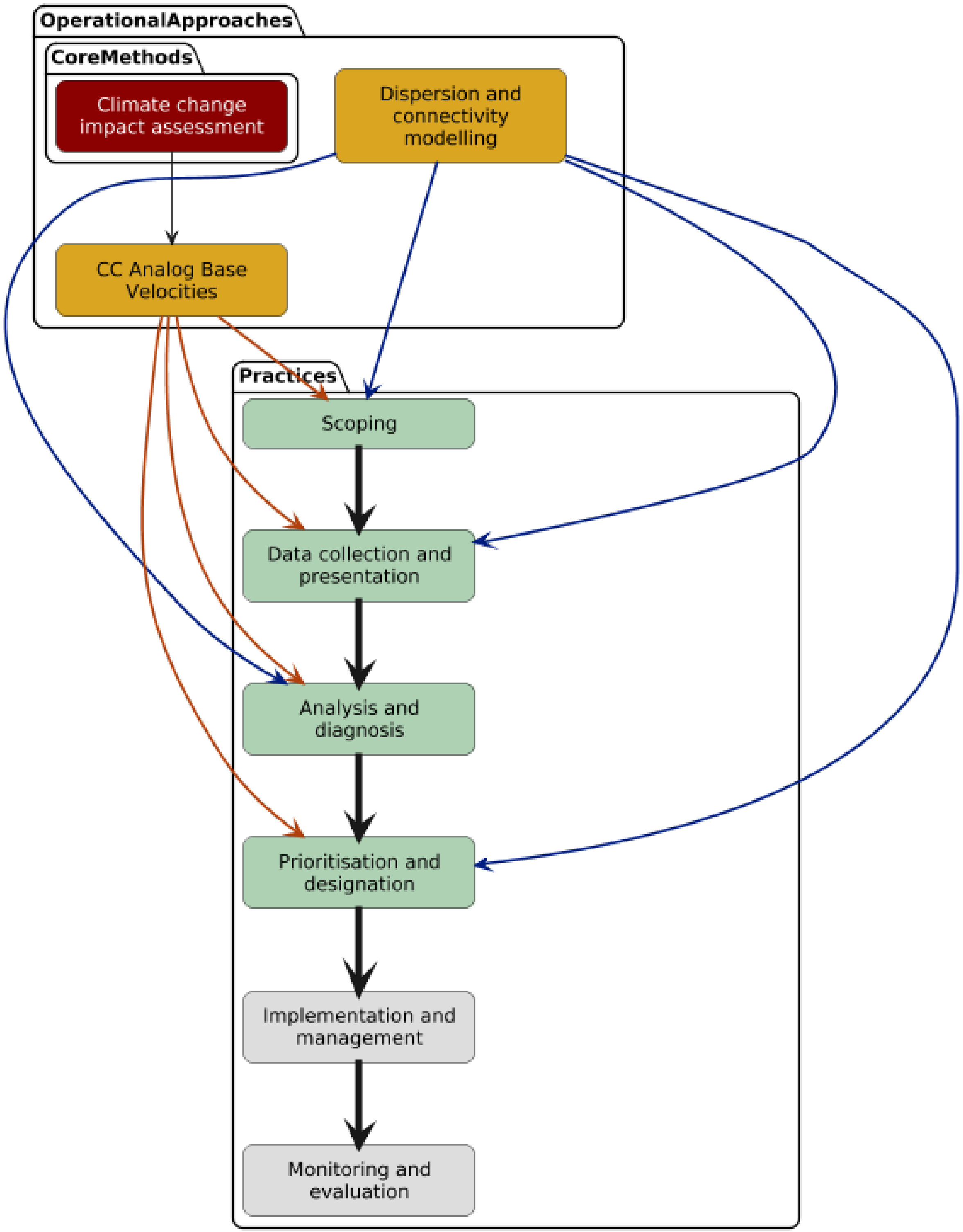
Broader "Question"

- *Q 54 - How to anticipate and address climate change within MPA?*

Related sites

- *Western Black Sea*

7.14.1 Answers



Operational approaches

- *Dispersion and connectivity modelling* (Dispersion and connectivity modelling)
- *CC Analog Base Velocities* (Climate change impact assessment)

ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone Deep sea Offshore zone

Criteria classes: *1.1 Functional 1.1.1 Vulnerability 1.1.2 Stability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas 1.1.5 Climate-smart potential 1.2 Structural*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Stability*
    - Macro-criterion *Functional hotspots*
    - Macro-criterion *Life cycle critical areas*
    - Macro-criterion *Climate-smart potential*
  - Subcategory *Structural*

Operational approaches: *(Method) Dispersion and connectivity modelling (Tool) CC Analog Base Velocities*

Implementation details

The analysis of species migration pathways under climate change is all the most important for the design of MPA networks. Designed to enhance connectivity (larval and adult), MPA networks will probably used as migration route for many species under changing conditions.

To anticipate the effect of climate change, it is necessary to project the future conditions using anomalies analysis to assess which areas of a network will be influenced by CC. Once the influence is supposed, it is important to assess the trends that the species will follow inside the area. Two elements must be taken into account to anticipate climate effects: - Adults connectivity: for adults, a selection of Vulnerable species and highly opportunistics species regarding to climate change can be identified as priority using a Trait-based Vulnerability Assessment (CAMBRA et al., 2024 . Chapter 3.3 Sensitivity and followings chapters). Then combined analysis of climate-analogs and species' bioclimatic velocities analysis can be performed to assess potential future trends and pathways of migration under different climatic scenarios (chapter 3.2.4). The same approach could be used to evaluate invasive risk and identify potential invasive routes (Azzurro and D'Amen, 2022) through the network. When the probable routes are identified under different climatic pathways, an analysis of the accuracy of the current MPA network could be performed to assess the areas still relevant for the conservation of the species of concern or if it is necessary to implement new potential targeted areas. - Larval connectivity: the maximum acceptable distance is today estimated at 15-20km based mainly on larval dispersal models (Mora, 2008; Shanks et al., 2003) but should be reevaluated with the future current changes, eventually based on lagrangian and habitat suitability models as proxy. This will lead to develop a better knowledge of actual and future connection between areas of interest and identify potential sources and sinks inside the network.

Then, to adress the climate effects it is necessary to promote the development of a global prismatic scenario, ensuring the safegard of replicat of the same management target (Function, Species…). To facilitate the operationality of climate protection and compensate for the impossibility to protect all the conservation, mitigation and adaptivity objectives on a single MPA, the network aims to "share the burden". The coherence of the networks under climate change should be structural but also in the objectives, protecting the highest variety of targets following the prismatic scenarios (chapter 5.3.1, including conservation, mitigation and adaptation pathways and relative targets). Building a coherent networks supports monitoring approaches, essential to verify the relevance of the models and ensure an adapted management and planning but also to evaluate potential management success (chapter 6.3 Insight for monitoring).

Notes

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n°101060707)

7.15 Q 56 - How to anticipate changes in biotopes due to climate change?

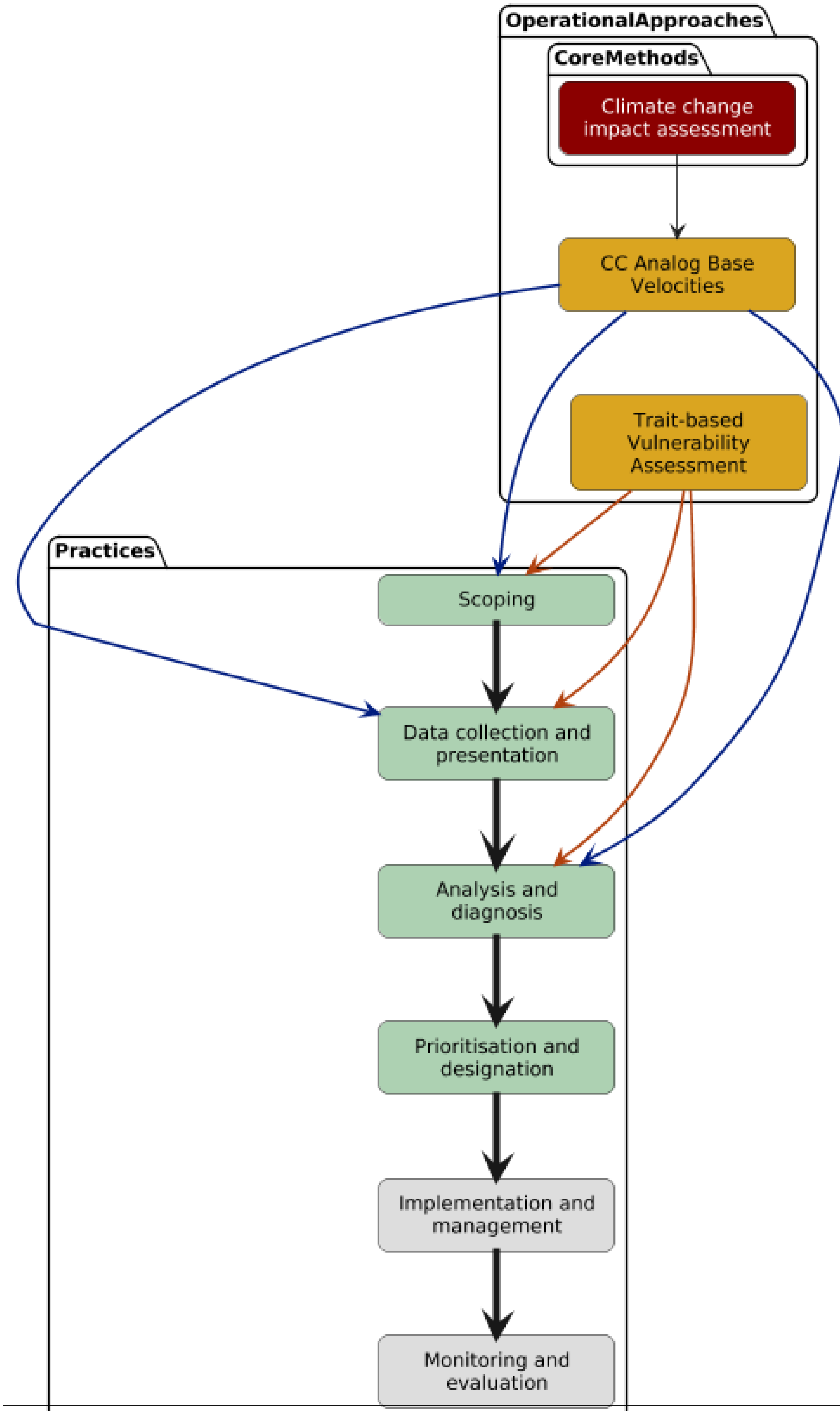
Narrower "Questions"

- *Q 57 - How to prioritize areas to be protected in view of climate changes (including shertered areas)?*
- *Q 60 - What is the impact of CC on deep ecosystems?*
- *Q 59 - What is the impact of CC on marine mammals?*

Related sites

- *Western Black Sea*

7.15.1 Answers



Operational approaches

- *CC Analog Base Velocities* (Climate change impact assessment)
- *Trait-based Vulnerability Assessment* (Trait-based Vulnerability Assessment)

ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Criteria classes: *1.1.1 Vulnerability 1.1.2 Stability 1.1.3 Functional hotspots 1.1.5 Climate-smart potential 1.2 Structural*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Stability*
    - Macro-criterion *Functional hotspots*
    - Macro-criterion *Climate-smart potential*
  - Subcategory *Structural*

Operational approaches: *(Tool) CC Analog Base Velocities (Method) Trait-based Vulnerability Assessment*

Implementation details

Analysing the future changes in climate requires the modelling of future conditions in an area of interest at different time scales. Use the velocities methods to analyse future climatic trends and trajectories in an area of interest to identify stable and non stable areas (3.2.4 Climate exposure assessment in CAMBRA et al., 2024). Analyse species traits (Sensitivity, Vulnerability, Adaptivity) as a proxy to identify the species at risk or that have potentially adapted to the new conditions in the area and prioritise species to be included in the analysis. Biotic velocities are methods adapted to evaluate future trends in species distribution. Analyse the role of the species in the area (Functionality related to food web structure/trophic level and known function(s) and ecosystem services) to identify potential socio-economic, functional and structural loss or possible transfer of this role (redundancy criterion) to other less sensitive species (refer to the Stability criteria). Under Climate Change, the Redundancy of functions in an area is central as a resistance measure. The combined analysis of climate-analogs and invasive species' bioclimatic velocities is also a good way to evaluate invasive risk and identify potential invasive routes (Azzurro and D'Amen, 2022) to be taken into consideration in the MSP decision process or to promote attenuation measures.

Develop monitoring to identify the emergence of new stressors and species migrations is a key element.

Notes

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n°101060707)

7.16 Q 57 - How to prioritize areas to be protected in view of climate changes (including shertered areas)?

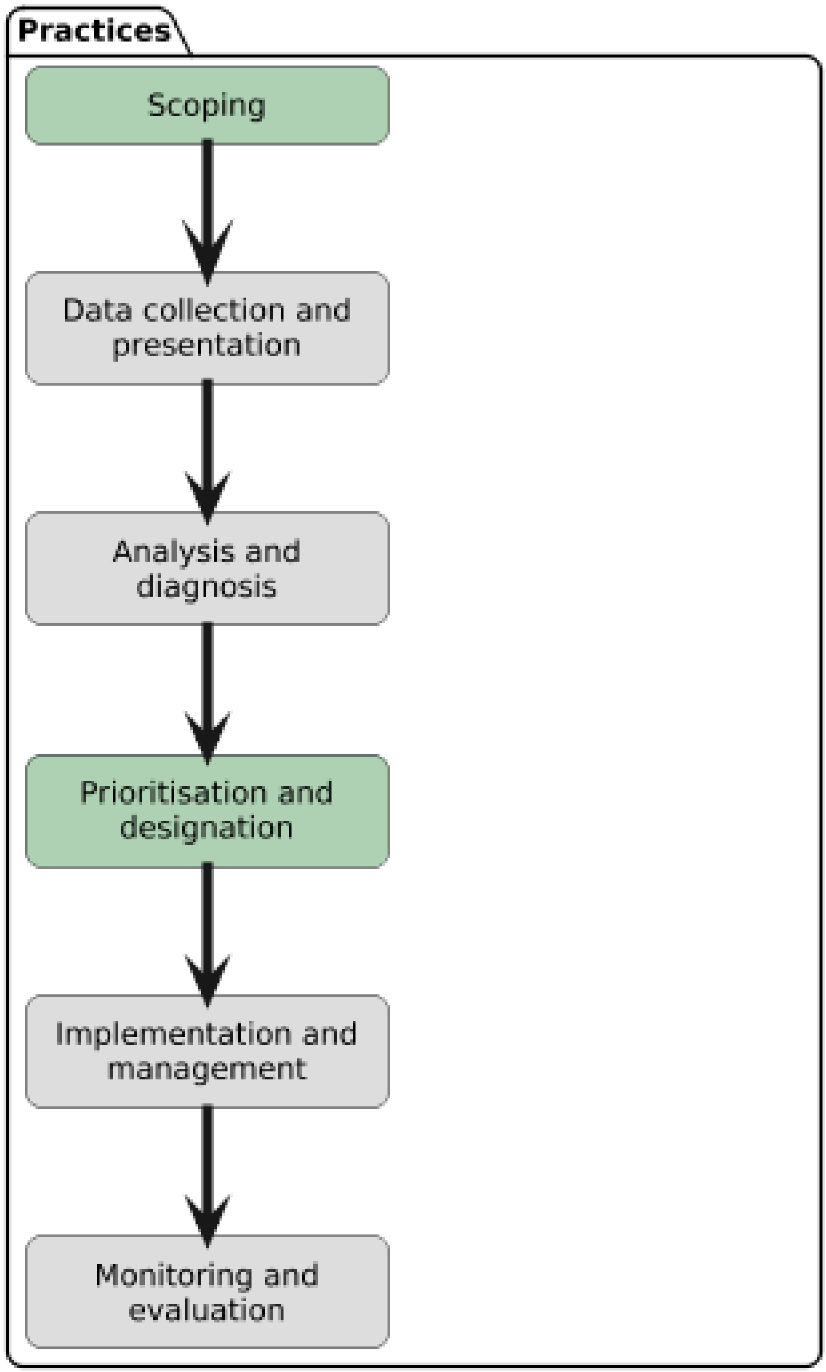
Broader "Question"

- *Q 56 - How to anticipate changes in biotopes due to climate change?*

Related sites

- *Western Black Sea*

7.16.1 Answers



ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone Deep sea Offshore zone

Criteria classes: *1 Ecological and genetic criteria 1.1 Functional 1.1.1 Vulnerability 1.1.2 Stability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas 1.1.5 Climate-smart potential 1.2 Structural 1.3 Genetic 1.4 Ecological status*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Stability*
    - Macro-criterion *Functional hotspots*
    - Macro-criterion *Life cycle critical areas*
    - Macro-criterion *Climate-smart potential*
  - Subcategory *Structural*
  - Subcategory *Genetic*
  - Subcategory *Ecological status*

Implementation details

Before entering into the prioritization phase, it is necessary to define the purpose of the protection (define the objectives and the desirable narratives to reach the objectives, i.e. the crucial Scoping phase). To support the framing of objectives and their selection, refer to step 1 of the MSP4BIO climate-related guidance. When the objectives are defined, a methodology and a synthesis of relevant elements can be followed in the chapter 5 "Risk Assessment" of the MSP4BIO climate-related guidance (CAMBRA et al., 2024). Criteria (D3.4) such as refuge areas and functional hotspots inner criteria (key functional areas, e.g. Carbon sink areas, areas with high concentrations of primary productivity) are directly relevant to this question and should be identified within the area of interest.

Notes

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n°101060707)

7.17 Q 60 - What is the impact of CC on deep ecosystems?

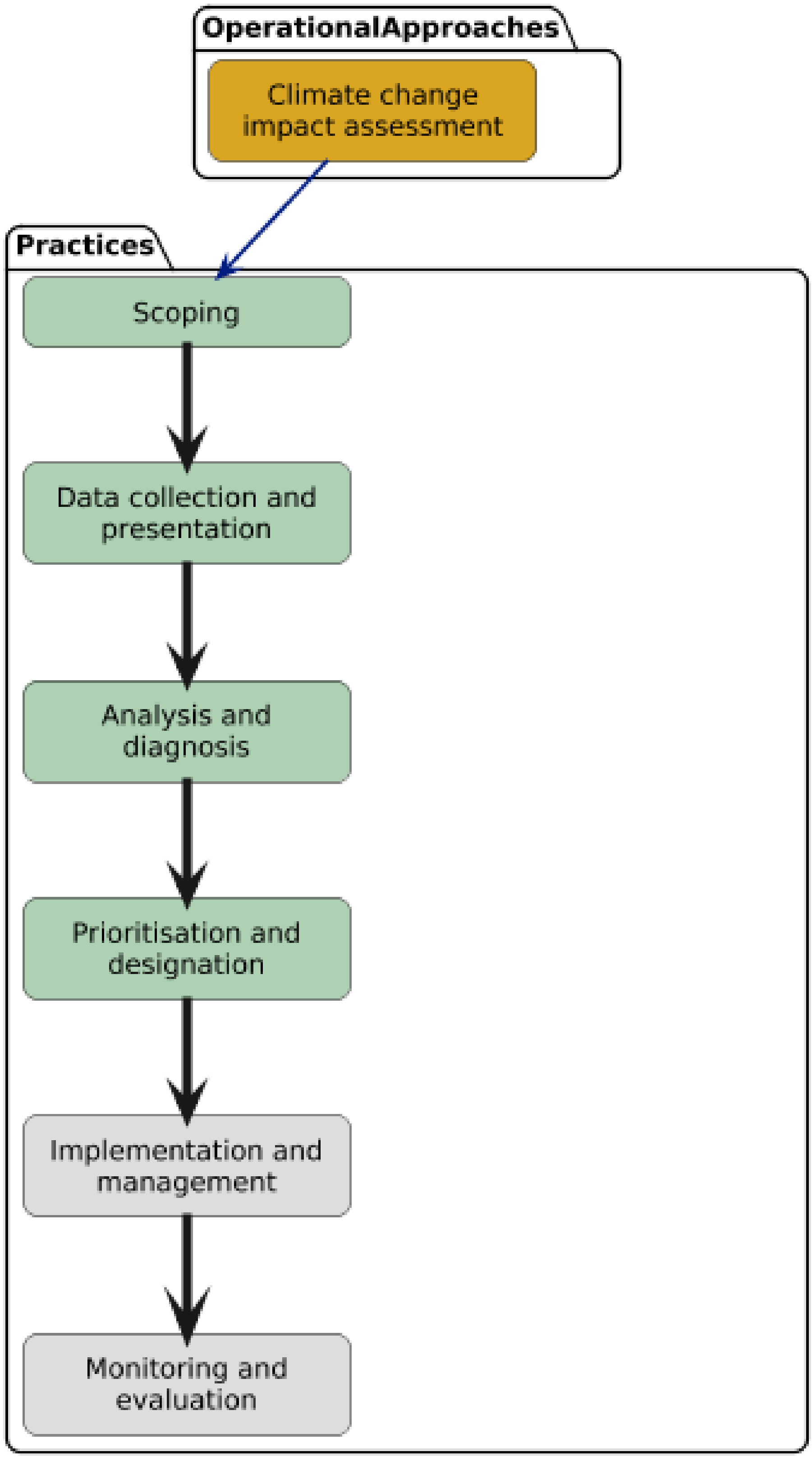
Broader "Question"

- *Q 56 - How to anticipate changes in biotopes due to climate change?*

Related sites

- *North-Western Mediterranean (NW-MED)*

7.17.1 Answers



Operational approaches

- *Climate change impact assessment* (Climate change impact assessment)

ESE1 - Ecological toolkit

Practices: *Scoping Implementation and management*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Deep sea

Criteria classes: *1.1.1 Vulnerability 1.1.2 Stability 1.1.3 Functional hotspots*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Stability*
    - Macro-criterion *Functional hotspots*

Operational approaches: *(Method) Climate change impact assessment*

Implementation details

The incidence of CC on deep-ecosystem is complex but the concerns are mainly related to habitats destruction and functional loss (Functionality - Functional hotspots) as deep-ecosystems are productive areas for lots of fisheries and for ecological functional such as carbon storage. The incidence of CC on deep-ecosystem is still mainly unknown as the only biological indicator considered is mortality. There is a great need to develop dedicated indicators at different depths as the incidence of CC could vary according to local conditions, as well as the need to develop further lab experiments to identify survival and stress thresholds for deep-sea species, such as their inner Potential for adaptation (Climate-smart potential). Moreover, the analysis of 3D waters is crucially important as there is an increasing recognition of the deep-sea waters for potential climate-refugees. The monitoring phase holds a key importance as well.

Performing a risk assessment for deep-sea species could provide a proxy of present and future exposure of deep ecosystems to CC, especially as physical parameters become increasingly available. To do so, follow the step-by-step MSP4BIO CC-related guidance searching for climate stable areas (Climatic stability, refuge areas) and analysing the Time of Emergence of each stressors. Protecting stable and connected areas (larval source and spawning areas) could be a key lever toward deep-sea species protection.

Notes

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

7.18 Q 59 - What is the impact of CC on marine mammals?

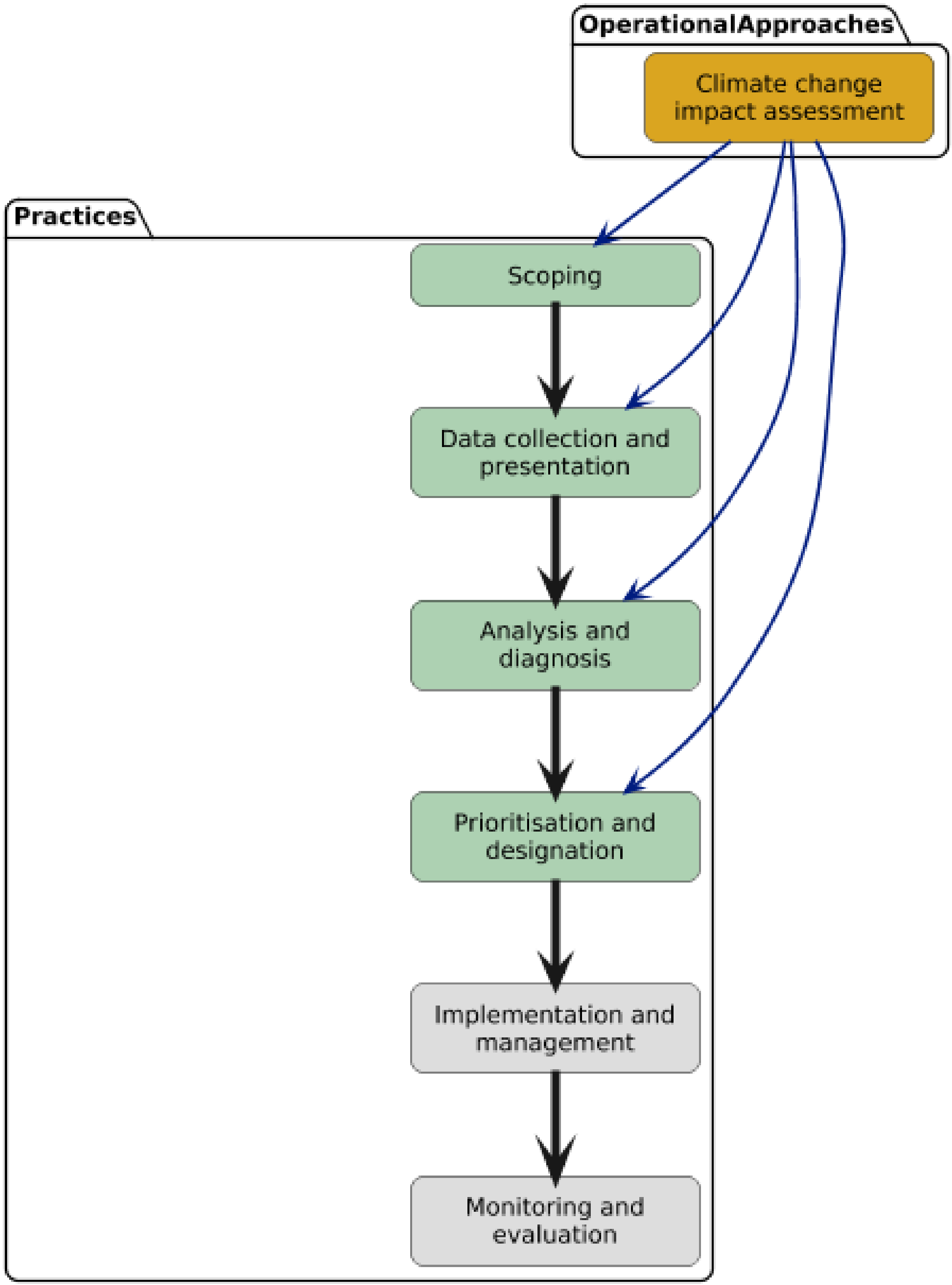
Broader "Question"

- *Q 56 - How to anticipate changes in biotopes due to climate change?*

Related sites

- *North-Western Mediterranean (NW-MED)*

7.18.1 Answers



Operational approaches

- *Climate change impact assessment* (Climate change impact assessment)

ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National
Protection regimes: Strict protection Non-strict protection
Marine zones: Offshore zone

Criteria classes: *1.1.1 Vulnerability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Functional hotspots*
    - Macro-criterion *Life cycle critical areas*

Operational approaches: *(Method) Climate change impact assessment*

Implementation details

The dependence of marine mammals on the air-sea surface realm makes them sensitive to different types of CC stressors (more information on Sensitivity traits could be found in CAMBRA et al., 2024 and inner bibliography). Some reviews were written about the incidence of CC on marine mammals (see notes as example), we nevertheless highly recommend that you perform your own literature review regarding your targeted species and the complexity of analysis you would like to reach (e.g., including only direct stressors on individuals, life-cycle critical areas or prey-predators interactions by performing a risk assessment for the main prey of your targeted species). Considering the highly mobile nature of marine mammals and the integration of connectivity elements in several macro-criteria, many of the inner criteria of Life cycle critical areas and Functional hotspots (Presence of key functional species) can be applied for cetaceans, such as identifying and protecting areas where they breed, feed and those used as nursery/developmental areas. Follow the scoping phase to support you to define the framework of analysis and consult the guidance (CAMBRA et al., 2024) to assess the Vulnerability macro-criterion.

Notes

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n°101060707)

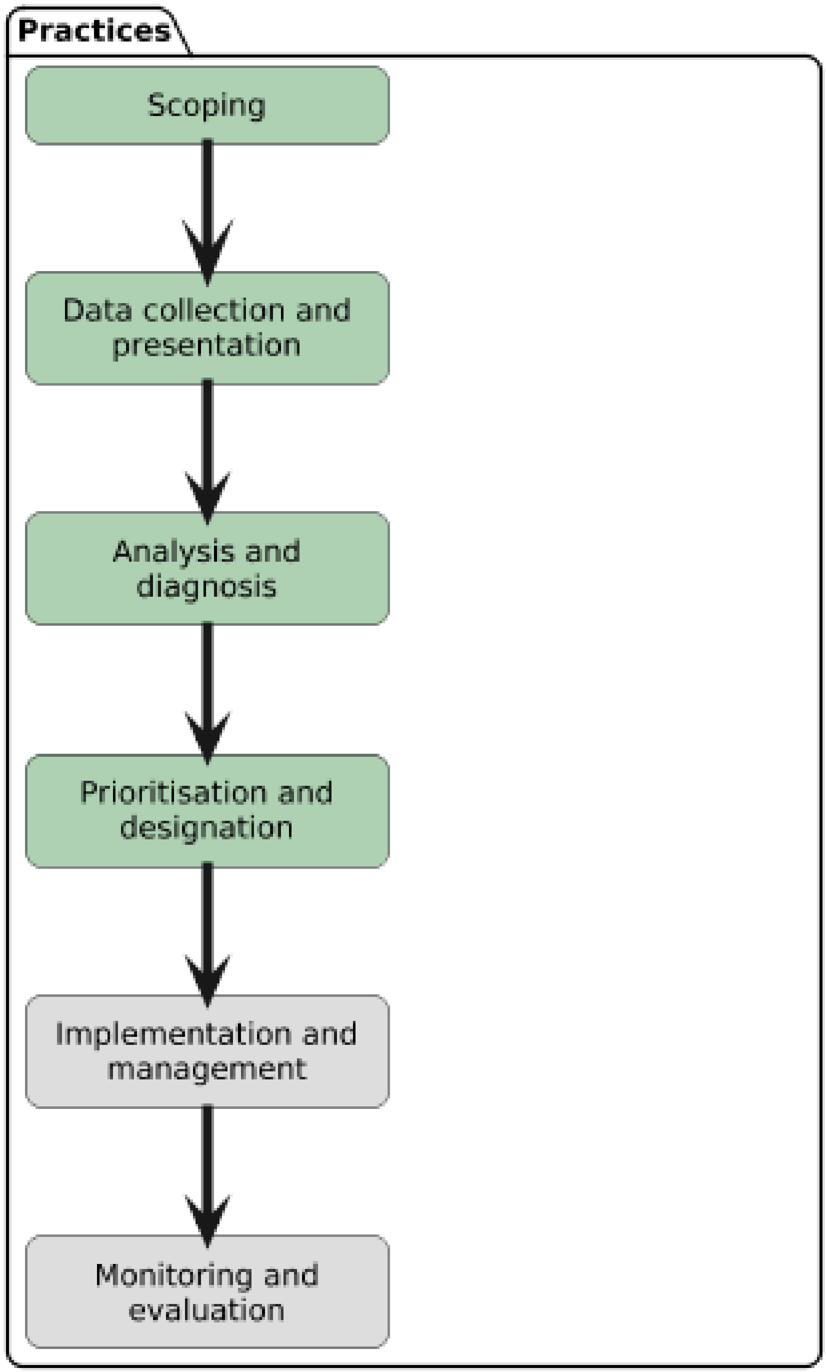
Frances M.D. Gulland, Jason D. Baker, Marian Howe, Erin LaBrecque, Lauri Leach, Sue E. Moore, Randall R. Reeves, Peter O. Thomas, A review of climate change effects on marine mammals in United States waters: Past predictions, observed impacts, current research and conservation imperatives, Climate Change Ecology, Volume 3, 2022, 100054, ISSN 2666-9005, https://doi.org/10.1016/j.ecochg.2022.100054.

7.19 Q 35 - How to assess and develop scenarios for MPA networks representativeness, ecological coherence, adequacy, comprehensiveness and connectivity. also in transboundary contexts?

Related sites

- *North-Western Mediterranean (NW-MED)*

7.19.1 Answers



ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Criteria classes: *1 Ecological and genetic criteria 1.1 Functional 1.1.1 Vulnerability 1.1.2 Stability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas 1.1.5 Climate-smart potential 1.2 Structural 1.3 Genetic 1.4 Ecological status*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Stability*
    - Macro-criterion *Functional hotspots*
    - Macro-criterion *Life cycle critical areas*
    - Macro-criterion *Climate-smart potential*
  - Subcategory *Structural*
  - Subcategory *Genetic*
  - Subcategory *Ecological status*

Implementation details

ESE1 Macro-Criterion Functional hotspots consists of several criteria that can aid in the consideration, inclusion and assessment of representativeness, ecological coherence, adequacy, comprehensiveness and connectivity. Identification and inclusion of criteria such as functionally representative areas; that are areas with many critical/key functions (D3.4), presence of key functional species, key functional areas and food web structure relate to the representativeness, ecological coherence and comprehensiveness of MPA networks. Connectivity is a central aspect of Macro-criterion Life cycle critical areas, which describes the different types of areas that are important for the completion of a species life cycle, such as steppingstone areas and ecological corridors. In addition, within the Macro-Criterion Climate-smart potential, criterion connectivity potential can offer additional insights for the assessment of connectivity in MPA networks. Chapters 5 and 6 of the MSP4BIO Climate Change guidance involves a review of criteria that can be useful for defining network design. Follow the step by step process detailed in the guidance (CAMBRA et al., 2024) that is making a overview of the methods to create a portfolio scenarios.

Notes

Question: How to assess and develop scenarios for MPA networks representativeness, ecological coherence, adequacy, comprehensiveness and connectivity. also in transboundary contexts?

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n°101060707)

7.20 Q 28 - How to create/increase stakeholder knowledge, awareness and engagement on MPAs and MSP?

Narrower "Questions"

- *Q 29 - How to assess stakeholders' satisfaction in a MSP/MPA process?*
- *Q 32 - How to create a culture of collaboration among MSP, MPA and sector responsible institutions?*
- *Q 30 - How to demostrate the effectiveness of conservation measures to stakeholders?*
- *Q 31 - How to move from participation to engagement and co-creation, transforming participation in a cultural behaviour?*

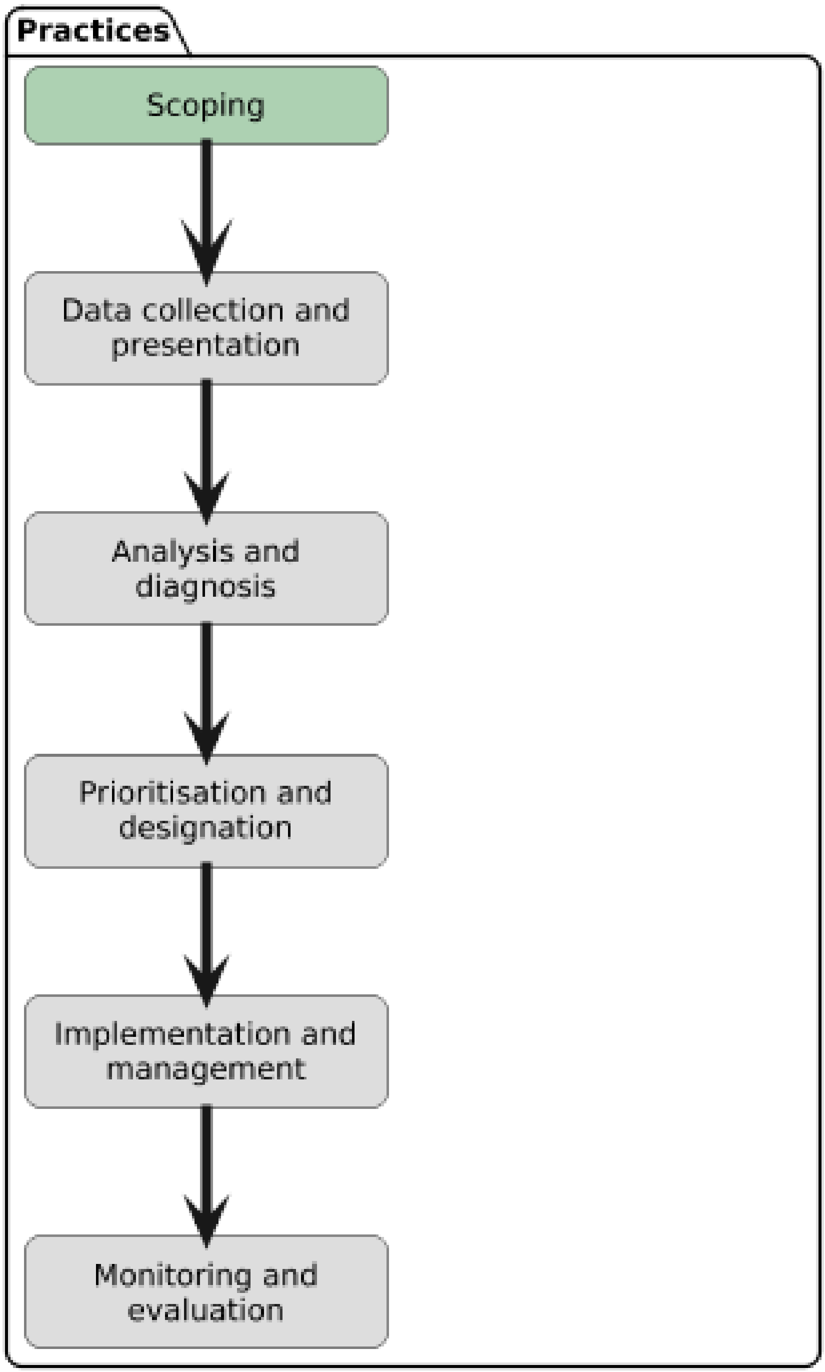
Related sites

- *Western Black Sea*

7.20.1 General answer

Effective communication tailored to diverse stakeholder types is essential to creating or increasing stakeholder knowledge, awareness, and engagement on MPAs and MSP, ensuring clear messaging and transparency. Early involvement and consultation build trust while setting realistic expectations, which helps manage differing objectives and interests. Providing accessible information, hosting interactive workshops, and sharing best practices can enhance understanding. Additionally, allocating adequate time and resources for engagement and securing government commitment ensures sustained collaboration and active participation in the process.

7.20.2 Answers



ESE1 - Ecological toolkit

Practices: *Scoping Prioritisation and designation Implementation and management Monitoring and evaluation*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone Deep sea Offshore zone

Implementation details

Ensure early inclusion of stakeholders to increase engagement in conservation and regular back-up. Work on and highlight the synergies between conservation and human objectives. Promote Equity in management plans and ensure that the conservation initiatives are grounded in relevant scientific knowledge, made available for stakeholders. Don't over-simplified scientific discourses that can lead to shortcuts that are detrimental in the long term. Encourage bottom-up initiatives, especially favourising the contact with the environment as it is fundamental that closure and conservation measure is sloped so as not to cut off access to the environment. Favorise on field presence of management officers and mediators, especially during summer, and promote human contacts.

Although this question relates more strongly to other ESE modules, from an ecological point of view, with regards to building stakeholder knowledge and awareness, certain central criteria and aspects from the ESE1 should be kept in mind. Building knowledge and awareness of key conservation issues can revolve around aspects such as the functional role species and habitats provide (e.g. criteria: food web structure, presence of key functional species such as Apex Predators and key functional areas e.g. carbon sink areas), life cycle critical areas whereby stakeholders can identify and understand the role of important areas for the life cycle and connectivity of species (e.g. developmental areas, larval sources, ecological corridors and spawning aggregation areas) and how impacts on these important functional and life cycle areas can have an effect of the stability and integrity of ecosystems and the vulnerability of impacts on other habitats and species. In essence the interconnectivity nature of the marine environment should be approached with an ecosystem-based management point of view.

7.21 Q 29 - How to assess stakeholders' satisfaction in a MSP/MPA process?

Broader "Question"

- *Q 28 - How to create/increase stakeholder knowledge, awareness and engagement on MPAs and MSP?*

Related sites

- *Azores Archipelago*

7.21.1 General answer

To assess stakeholders' satisfaction in an MSP/MPA process, it is essential to evaluate communication effectiveness, ensuring it is adapted to different stakeholder types and whether expectations were clearly set and met throughout the process. This can be achieved through surveys, interviews, or participatory workshops that gauge stakeholders' perceptions of transparency, trust, and inclusiveness in decision-making. Additionally, analysing the extent of their early involvement, the adequacy of time and resources allocated for engagement, and the alignment of outcomes with their interests can provide valuable insights. Ensuring government commitment and legitimacy of the process should also be a key assessment criterion.

7.22 Q 32 - How to create a culture of collaboration among MSP, MPA and sector responsible institutions?

Broader "Question"

- *Q 28 - How to create/increase stakeholder knowledge, awareness and engagement on MPAs and MSP?*

Related sites

- *Gulf of Cadiz*

7.22.1 General answer

To create a culture of collaboration among MSP, MPAs, and sector-responsible institutions, it is essential to prioritise transparent communication tailored to the needs and perspectives of diverse stakeholders, ensuring early and meaningful involvement in decision-making processes. Establishing clear expectations, fostering trust through transparency, and allocating sufficient resources to balance conflicting objectives lay the groundwork for effective collaboration. Encouraging government commitment further legitimises decisions and builds institutional confidence. Additionally, promoting stakeholder knowledge and awareness through capacity-building initiatives and leveraging good practices can enhance mutual understanding and drive collective efforts toward shared goals.

7.23 Q 30 - How to demostrate the effectiveness of conservation measures to stakeholders?

Broader "Question"

- *Q 28 - How to create/increase stakeholder knowledge, awareness and engagement on MPAs and MSP?*

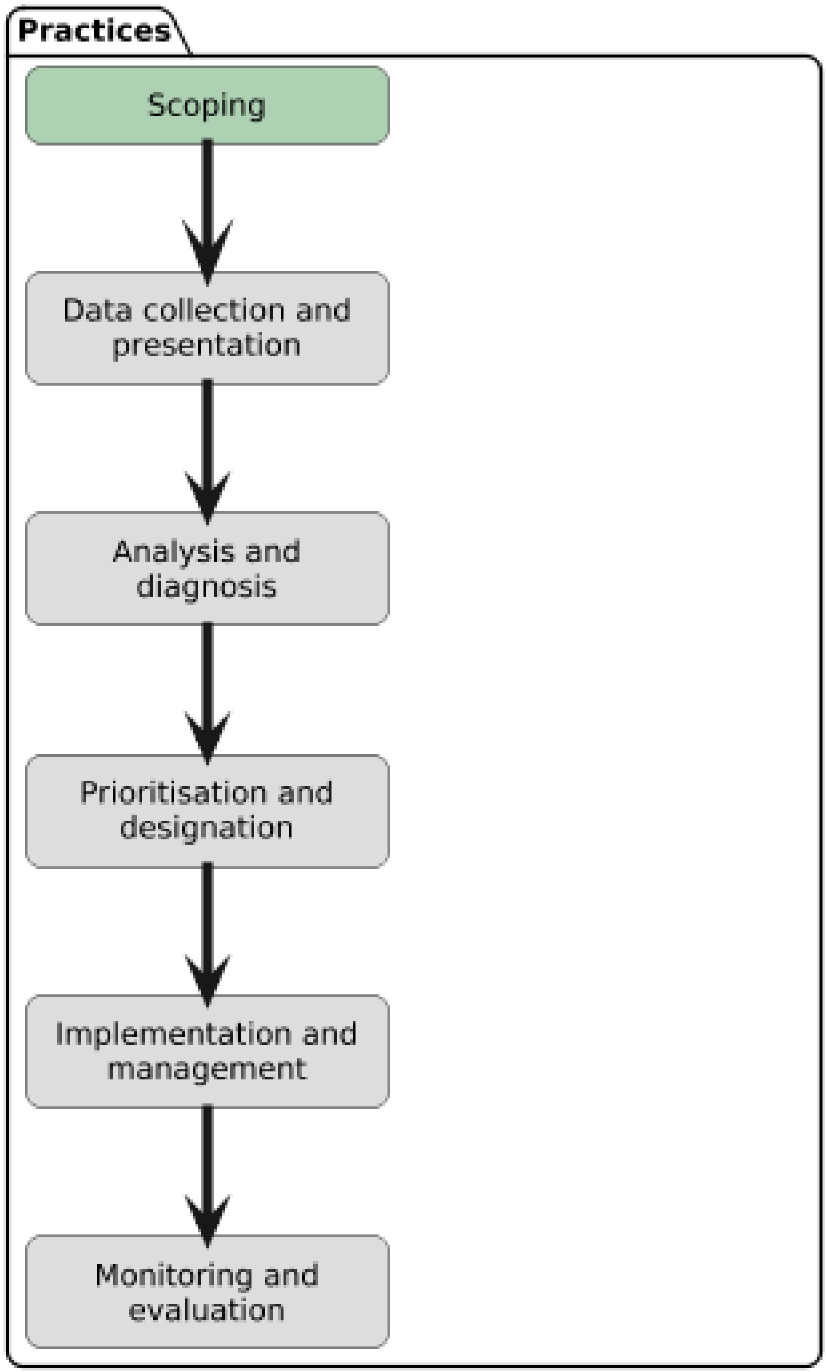
Related sites

- *Azores Archipelago*

7.23.1 General answer

To demonstrate the effectiveness of conservation measures to stakeholders, it is crucial to use clear, transparent, and accessible communication tailored to their needs. Presenting measurable outcomes, such as improved biodiversity, socioeconomic benefits, or ecosystem health, through data visualisation, reports, and case studies can help illustrate success. Early involvement of stakeholders in monitoring and evaluation processes fosters trust and ownership while ensuring regular updates and maintaining transparency. Providing opportunities for dialogue and feedback also strengthens engagement and demonstrates a commitment to inclusiveness and collaborative decision-making.

7.23.2 Answers



ESE3 - Trade-offs method for protections and restoration in MSP

Practices: *Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone Deep sea Offshore zone

Implementation details

1. **Collect and Present Data**: Utilize biological valuation maps and ecosystem service assessments to provide quantitative evidence of the benefits derived from conservation measures. These data can illustrate improvements in biodiversity and ecosystem health (page 42). Use of the Guidelines for applying trade-off methodology for MPA design (Figure 04) from Deliverable 4.3 “Trade-offs method for protection and restoration in MSP”, including all annexes.
2. **Participatory Tools**: Implement participatory mapping tools like SeaSketch to engage stakeholders in real-time discussions regarding conservation successes. This can enhance their understanding and acceptance of the measures taken (pages 38, 46). Use of Annexe 5 - Table Participatory Mapping Tool. From Deliverable 4.3 “Trade-offs method for protection and restoration in MSP”
3. **Conduct Workshops**: Organize workshops to facilitate discussions on trade-offs and the socioeconomic impacts of conservation. Including diverse stakeholder perspectives in these dialogues can build a consensus on the benefits and necessity of conservation initiatives (page 40).
4. **Highlight Economic Benefits**: Clearly communicate the economic benefits and ecosystem services that conservation measures provide, such as enhanced fisheries or increased tourism opportunities. Demonstrating these connections can help stakeholders appreciate the value of conservation efforts (page 25).

5. **Ongoing Monitoring and Feedback**: Establish continuous monitoring programs to track the outcomes of conservation measures and adjust strategies as needed. Sharing results with stakeholders can reinforce trust and encourage ongoing support. Use of Annexe 5 - Table Participatory Mapping Tool. From Deliverable 4.3 “Trade-offs method for protection and restoration in MSP” By employing these strategies, you can effectively convey the importance and impact of conservation measures, fostering greater stakeholder engagement and support.

Notes

More information at: Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

7.24 Q 31 - How to move from participation to engagement and co-creation, transforming participation in a cultural behaviour?

Broader “Question”

- *Q 28 - How to create/increase stakeholder knowledge, awareness and engagement on MPAs and MSP?*

Related sites

- *Gulf of Cadiz*

7.24.1 General answer

To move from participation to engagement and co-creation, transforming it into a cultural behaviour, it is essential to foster transparency, trust, and inclusivity from the outset by involving stakeholders early and aligning their diverse objectives through effective communication. This requires adapting communication to different stakeholder types, creating spaces for meaningful interaction, and dedicating time and resources to build relationships. To embed this as a cultural norm, the process must emphasise collaboration, mutual knowledge creation, and the demonstration of the tangible benefits of participation, supported by government commitment and consistent, transparent decision-making that values shared ownership and accountability. Promoting capacity-building and Ocean Literacy in the process could also be beneficial.

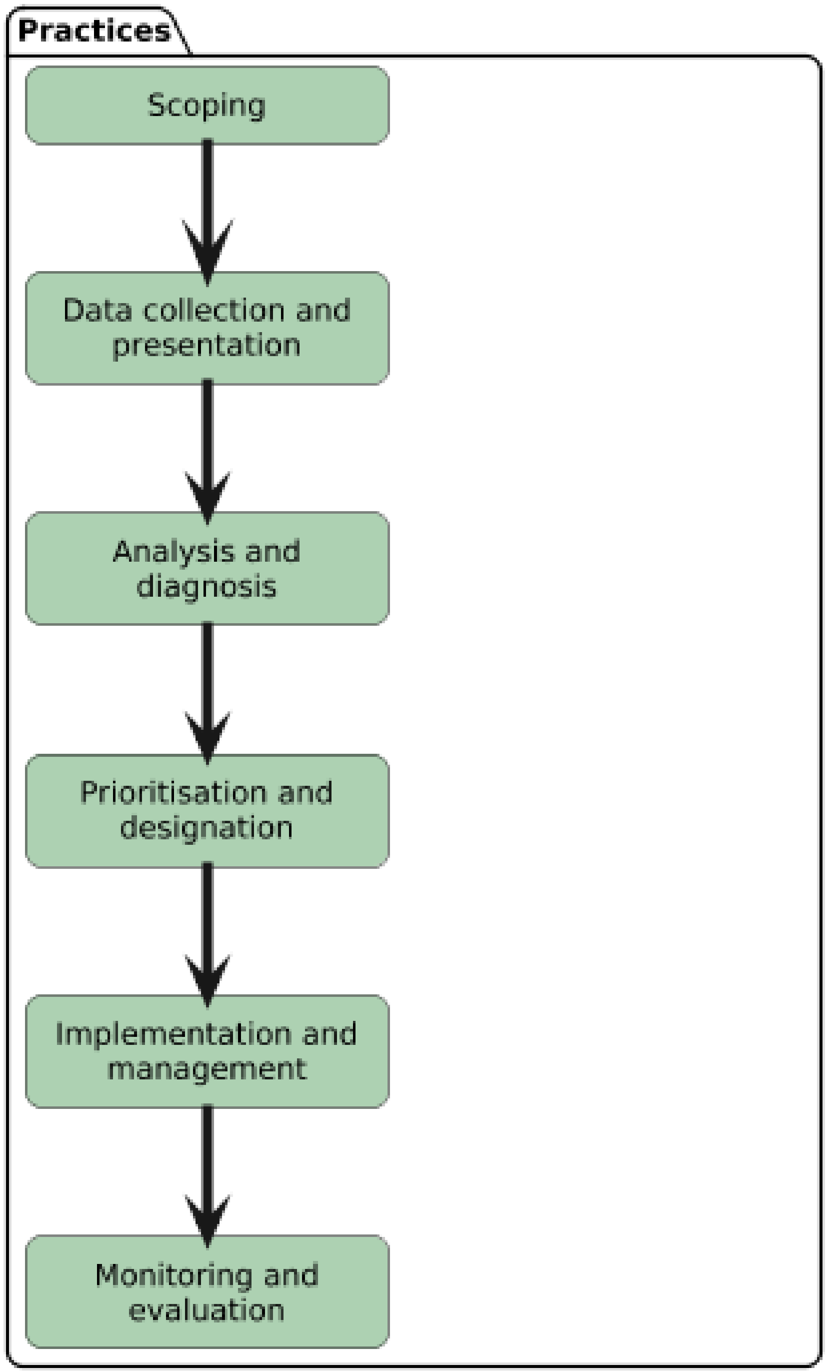
7.25 Q 9 - How to effectively manage conservation areas including both terrestrial and marine zones?

Related sites

- *Azores Archipelago*

Notes The conservation unit should support conservation of e.g. marine birds, particularly relevant for lagoons and anadromous and catadromous species. To be associated with regional and national initiative such as the French "Trame verte et bleue"

7.25.1 Answers



ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management*
Spatial scales: Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone

Criteria classes: *1.1.4. Life cycle critical areas*

Criteria

- Category *Socio–economic & governance criteria*
  - Subcategory *Socio–economic criteria*
    - Criteria *Area of high scientific interest*
  - Subcategory *Governance criteria*
    - Criteria *Coherence management of the area*
- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Stability*
      - Criteria *Ecosystem Integrity*
    - Macro-criterion *Climate-smart potential*
      - Criteria *Concentrative Potential of Species of interest*
      - Criteria *Connectivity Potential*
    - Macro-criterion *Life cycle critical areas*

Implementation details

Step 1: Define a list of species of interest for which the completion of life cycle depends both of a terrestrial (or freshwater) and marine phase (e.g. eels). Identify relevant boundaries of the conservation unit (including both land and sea) for these species to ensure a conservation of the complete life cycle (including species essential habitats first then main prey essential habitats). Use the "Criteria to prioritize species/ecosystems for conservation" from D2.2 to identify potential priorities among species.

Step 2: Map critical areas for each of this species and ecological corridors (e.g. Connectivity areas, nesting cliffs) when identified (e.g. estuary)

Step 3: Highlight concentrative areas (benefitting to a wide range of species or of species of high interest following the criteria to prioritize species and ecosystems, or species of local interest)

Step 4: concentrate on these areas and initiate trade-off analysis to define acceptable boundaries/measures to protect species life cycle and essential habitats

Step 5: Work in network and promote management bodies cooperation (especially between marine and terrestrial authorities) to ensure that the life cycles of these species are completely covered and that the protection from terrestrial and seaside are coherent. A list of common species and coherent calendar of management actions need to be establish between management bodies.

Considering the nature of the question with the goal of effectively managing conservation areas in both terrestrial and marine zones, connectivity of habitats and species should remain a focal point at each step of the process. ESE1 Ecological Macro-Criteria Stability (inner criteria Ecosystem Integrity) depends on the maintenance of connectivity between different biomes, for example an apex predator such as a seabird species that migrates between different realms during its life cycle. As a result the Macro-criteria life cycle critical areas is pivotal, with criteria such as developmental and feeding/foraging habitats, ecological corridors, recruitment areas and nursery grounds being strongly related to this conservation objective. Furthermore, the effective management of terrestrial and marine conservation areas with Step 1 and 2 requires identifying criteria Key functional areas and presence of key functional species (Macro-criterion Functional hotspots) that ideally should be within the list of species of interest and habitats required for the aforementioned species.

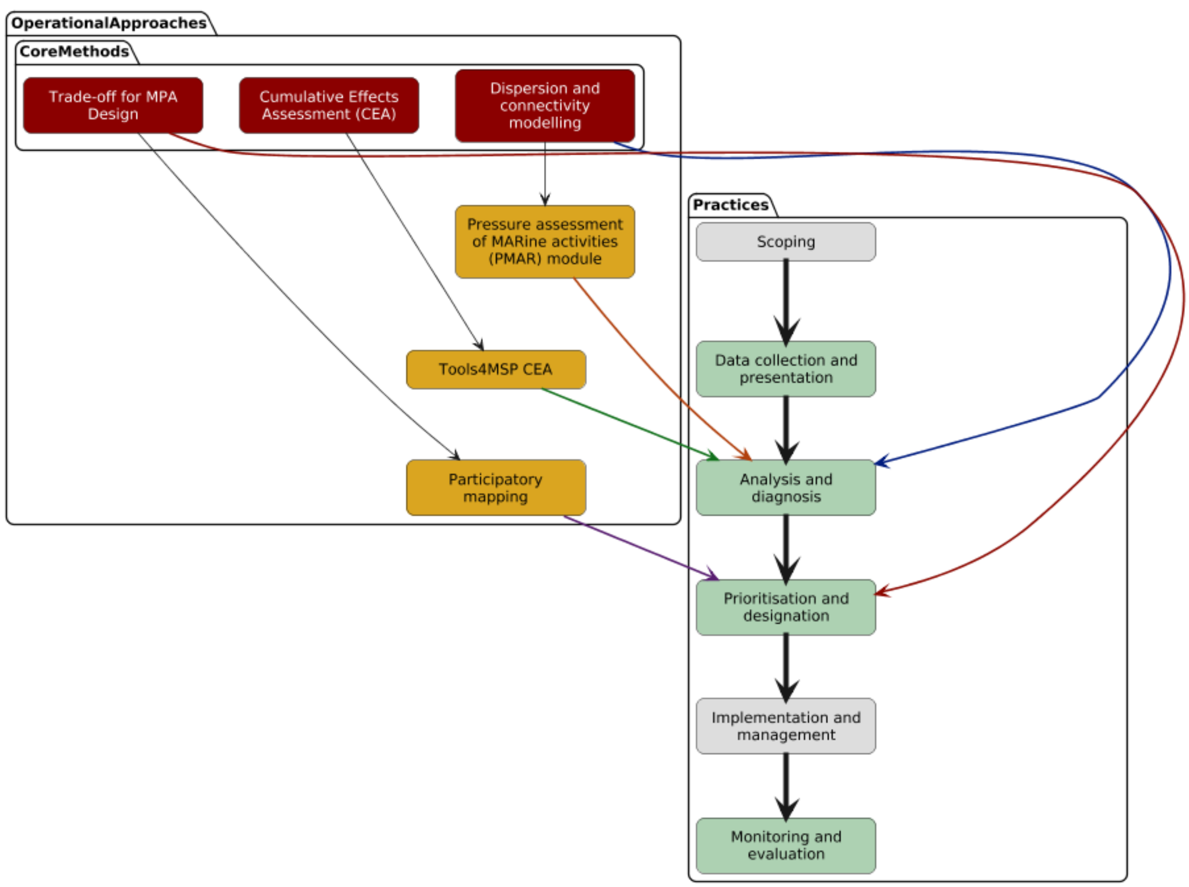
7.26 Q 12 - How to evaluate cumulative impacts in MSP and MPA?

Related sites

- *Baltic Sea basin and Vistula Lagoon/Southern Baltic*
- *Western Black Sea*

Source Matczak et al. (2024) Test Sites Methodology Including the Participation Strategy (Deliverable – D5.2., under the WP5 of MSP4BIO project (GA n° 101060707))

7.26.1 Answers



Operational approaches

- *Dispersion and connectivity modelling* (Dispersion and connectivity modelling)

- *Pressure assessment of MARine activities (PMAR) module* (Dispersion and connectivity modelling)
- *Tools4MSP CEA* (Cumulative Effects Assessment (CEA))
- *Trade-off for MPA Design* (Trade-off for MPA Design)
- *Participatory mapping* (Trade-off for MPA Design)

ESE1 - Ecological toolkit

Practices: *Analysis and diagnosis*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone
Applications: *Application of the HELCOM SPIA Tool for HELCOM MPAs*

Criteria classes: *1.1.1 Vulnerability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Functional hotspots*
    - Macro-criterion *Life cycle critical areas*

Operational approaches: *(Method) Dispersion and connectivity modelling (Tool) Pressure assessment of MARine activities (PMAR) module (Tool) Tools4MSP CEA*

Implementation details

Step1: Identify anthropogenic activities in the area of interest as far as targeted and key areas/species of conservation interest. Select pressure by identifying overlap between species distributions and pressures.

Step 2: Perform a vulnerability analysis for the selected stressors for the list of species/areas defined as of prior interest to identify conservation priorities. For a first approach, consider each pressure as additive and make a vulnerability assessment per pressure. Sum the results on a map, eventually introducing a weighting system on human stressors linked to pressure intensity.

Prospection (eventually): In general, the risk assessment is analyzed into defined boundaries (such as those of an MPA) which can lead to underestimation of the impacts on the whole marine system (e.g., basin scale). If possible, consider adjacent areas (e.g., connected areas) and future climatic projections to perform a better risk analysis. To go more in depth in the potential interactions of stressors, you can have a look at the following paper: Nogues et al., 2021.

MSPdF Classification: *Marine & Coastal Environment -> Ecosystem: Species Marine & Coastal Environment -> Ecosystem: Habitat Marine & Coastal Environment -> Ecosystem: Ecosystems, including food webs Marine & Coastal Environment: Pressure Maritime Activities and MSP*

Notes

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n°101060707)

Cumulative effects of marine renewable energy and climate change properties: sensitivity of ecological network analysis; Q. Nogues, A. Raoux, E. Araignous, A. Chaalali, T. Hattab, B. Leroy, F. Ben Rais Lasram, V. David, F. Le Loc'h, J. Dauvin, N. Niquil; Ecological Indicators, Volume 121, 2021, 107128, ISSN 1470-160X, https://doi.org/10.1016/j.ecolind.2020.107128.

Applications

- *Application of the HELCOM SPIA Tool for HELCOM MPAs*

ESE2 - Criteria for the representation of the social and economic dimension of MPAs

Practices: *Analysis and diagnosis*
Spatial scales: National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Offshore zone

Criteria classes: *5.1 Socio–economic criteria 5.1.1 Blue Economy 5.1.3 Human wellbeing*

Criteria

- Category *Socio–economic & governance criteria*
  - Subcategory *Socio–economic criteria*
    - Criteria *Area important for locally-caught seafood*
    - Criteria *Area important for the generation of employment and income linked to non traditional activities*
    - Criteria *Area important for fishery activity*
    - Criteria *Area important for dredging*
    - Criteria *Area important because of the presence of structure with significant historical and cultural. (mo*
    - Criteria *Area important for recreation and leisure*
    - Criteria *Area important for shipping*
    - Macro-criterion *Blue Economy*
    - Macro-criterion *Human wellbeing*
  - Subcategory *Governance criteria*
    - Criteria *Long term strategic adaptive management*

Notes

More information at:

Pegorelli et al. (2023). Criteria for the representation of the social and economic dimension of MPAs (Deliverable – D4.1., under the WP4 of MSP4BIO project (GA n° 101060707)).

ESE3 - Nature-inclusive operation of blue economy sectors

Practices: *Data collection and presentation Analysis and diagnosis Prioritisation and designation Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection

Criteria classes: *5.2 Governance criteria*

Criteria

- Category *Socio–economic & governance criteria*
  - Subcategory *Socio–economic criteria*
    - Criteria *Area important because it allows access to relevant areas for the marine users.*
    - Criteria *Area important for locally-caught seafood*
    - Criteria *Area important for the generation of employment and income linked to non traditional activities*
    - Criteria *Area important for fishery activity*
    - Criteria *Area important for dredging*
    - Criteria *Area important because of the presence of structure with significant historical and cultural. (mo*
    - Criteria *Area of high scientific interest*
    - Criteria *Area important because of the occurrence of iconic species/habitats for the local community*
    - Criteria *Area important for thehealth of coastal residents and/or resource users (mental health, physical hea*
    - Criteria *Area important due to the socio-cultural dependence of the coastal community with its environ*
    - Criteria *Area important because of the presence of cultural symbolic value*
    - Criteria *Area important for recreation and leisure*
    - Criteria *Area important because of the presence of cultural and tradition activities that support local fo*
    - Criteria *Area important for traditional human settlement, land-use, or sea-use which is representative of*
    - Criteria *Area with high scenic and/or aesthetic value*
    - Criteria *Area important for shipping*
    - Criteria *Area is important for the development of blue economy activities*
  - Subcategory *Governance criteria*
    - Criteria *Clear strategic plan for the development of sustainable blue economy*
    - Criteria *Cross-border cooperation*
    - Criteria *Decision making is based on best information and knowledge available*
    - Criteria *Strategic Environmental Assessment*

        * Criteria *Monitoring and evaluation*
        * Criteria *Instruments to ensure and guide development and implementation of marine policies*
        * Criteria *Sustainable fishing management*
        * Criteria *Ecosystem based management approach*
        * Criteria *Long term strategic adaptive management*
        * Criteria *Coherence management of the area*

Notes

More information at:

Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

ESE3 - Trade-offs method for protections and restoration in MSP

Practices: *Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection

Criteria classes: *5.2 Governance criteria*

Criteria

- Category *Socio–economic & governance criteria*
    - Subcategory *Socio–economic criteria*
        * Criteria *Area important because it allows access to relevant areas for the marine users.*
        * Criteria *Area important for locally-caught seafood*
        * Criteria *Area important for the generation of employment and income linked to non traditional activities*
        * Criteria *Area important for fishery activity*
        * Criteria *Area important for dredging*
        * Criteria *Area important because of the presence of structure with significant historical and cultural. (mo*
        * Criteria *Area of high scientific interest*
        * Criteria *Area important for educational interest*
        * Criteria *Area important because of the occurrence of iconic species/habitats for the local community*
        * Criteria *Area important for thehealth of coastal residents and/or resource users (mental health, physical hea*
        * Criteria *Area important due to the socio-cultural dependence of the coastal community with its environ*
        * Criteria *Area important to be managed due to the presence ofspatial conflicts among users*
        * Criteria *Area important because of the presence of cultural symbolic value*

    * Criteria *Area important for recreation and leisure*
    * Criteria *Area important because of the presence of cultural and tradition activities that support local fo*
    * Criteria *Area important for traditional human settlement, land-use, or sea-use which is representative of*
    * Criteria *Area with high scenic and/or aesthetic value*
    * Criteria *Area important for shipping*
    * Criteria *Area is important for the development of blue economy activities*
    * Criteria *Area with current/potential importance to explore and demonstrate approaches and management solution*
  - Subcategory *Governance criteria*
    * Criteria *Equity*
    * Criteria *Clear strategic plan for the development of sustainable blue economy*
    * Criteria *Cross-border cooperation*
    * Criteria *Decision making is based on best information and knowledge available*
    * Criteria *Monitoring and evaluation*
    * Criteria *Instruments to ensure and guide development and implementation of marine policies*
    * Criteria *Sustainable fishing management*
    * Criteria *Ecosystem based management approach*
    * Criteria *Long term strategic adaptive management*
    * Criteria *Coherence management of the area*
    * Criteria *Stakeholder participation*

Operational approaches: *(Method) Trade-off for MPA Design (Method) Participatory mapping*

Implementation details

Mainly through stakeholder engagement and Participatory Mapping to collect data for cumulative impact analysis.

Use of Annexe 5 - Table Participatory Mapping Tool. From Deliverable 4.3 “Trade-offs method for protection and restoration in MSP”

Notes

Use of the method Trade-off for MPA Design.

Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

7.26.2 Measures

ESE3 - Nature-inclusive operation of blue economy sectors

Practices: *Analysis and diagnosis*
Spatial scales: National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea

Measures details

For cumulative impact assessment, check the pressures on Ecosystem Services of each activity for the sector (Aquaculture, Fishery, Tourism, Non-living Marine Resources, Renewables) (Pegorelli et al. 2024)

Notes

More information at:

Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

ESE3 - Trade-offs method for protections and restoration in MSP

Practices: *Data collection and presentation Analysis and diagnosis Prioritisation and designation Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local

Measures details

Mainly through stakeholder engagement and Participatory Mapping to collect data for cumulative impact analysis.

Notes

Use of Annexe 5 - Table Participatory Mapping Tool. From Deliverable 4.3

7.27 Q 53 - How to identify and analyze the main conflict areas between human uses and the environment?

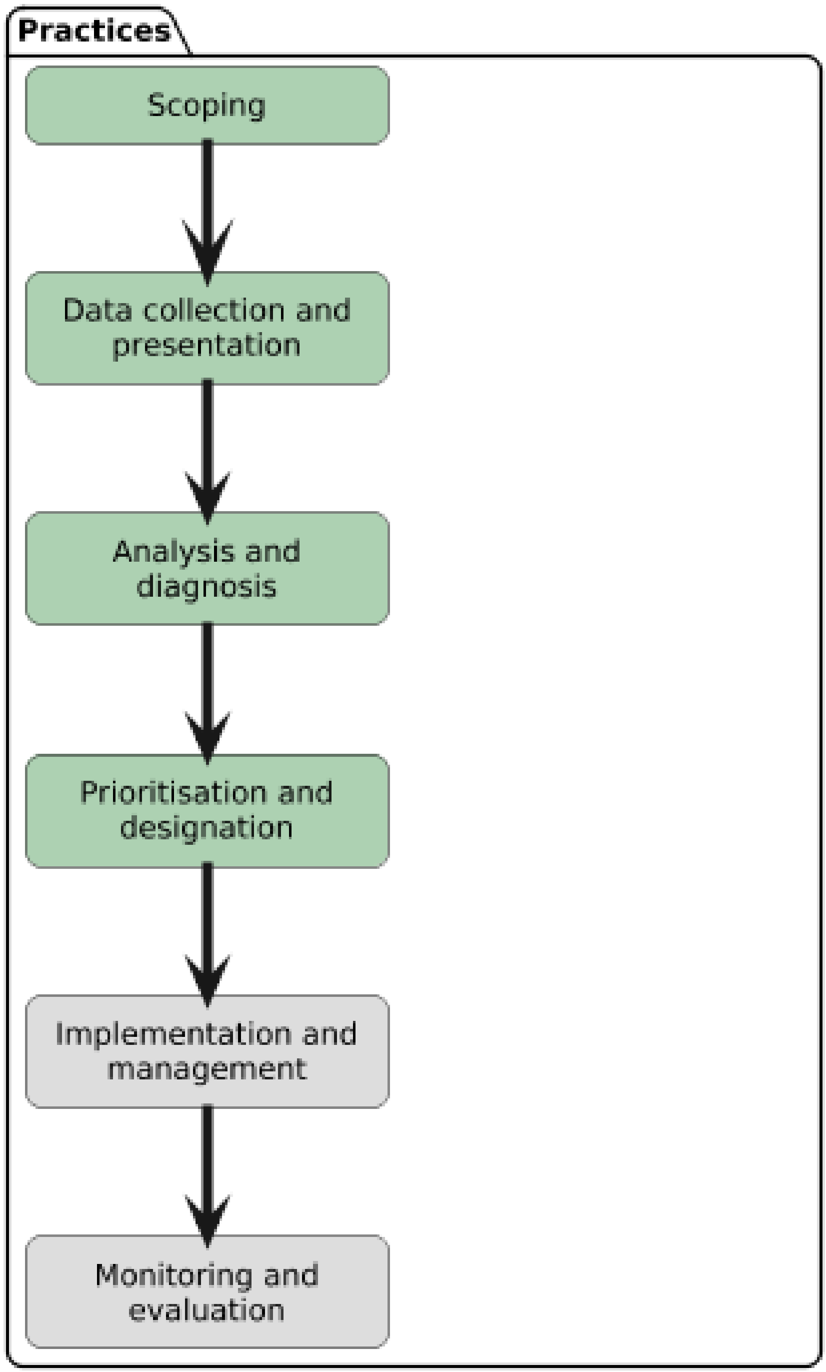
Narrower "Questions"

- *Q 8 - How to identify and analyze the main conflict area that may arise if we need to expand marine protected areas in response to sensitive habitats, ecological connectivity or other valuable ecological as*

Related sites

- *Baltic Sea basin and Vistula Lagoon/Southern Baltic*

7.27.1 Answers



ESE1 - Ecological toolkit

Practices: *Scoping*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone Deep sea Offshore zone

Implementation details

This question is in relation with Question 11. The analysis of synergies of the objectives (and human-wildlife interaction) between ecological and socio-economical components can lead us to identify a series of targets where ecological protection needs is contrary to socio-economical goals and human practices and so can lead to uses conflicts. The risk assessment (CAMBRA et al., 2024) will produce some maps that will support the process of identifying the areas concentrating the stakes and, probably, the conflicts. The nature of the conflicts needs then to be assessed more in depth and be included in the Trade-off assessment (cf. ESE 3). Conflicts need to be included in the feasability step prior of any implementation of rules or restrictions and risk can be spread using the Equity criteria.

7.28 Q 8 - How to identify and analyze the main conflict area that may arise if we need to expand marine protected areas in response to sensitive habitats, ecological connectivity or other valuable ecological as

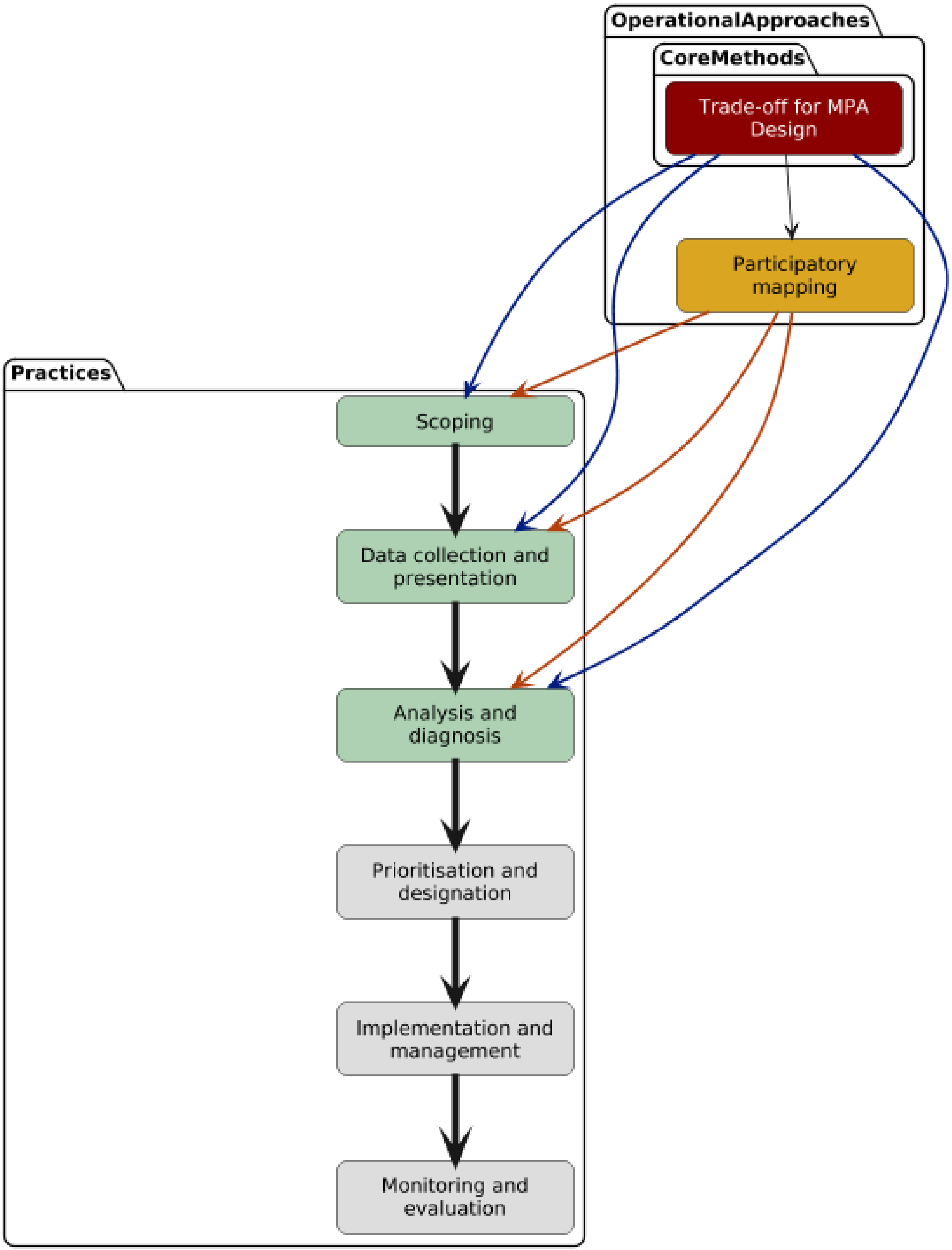
Broader "Question"

- *Q 53 - How to identify and analyze the main conflict areas between human uses and the environment?*

Related sites

- *Baltic Sea basin and Vistula Lagoon/Southern Baltic*
- *Western Black Sea*

7.28.1 Answers



Operational approaches

- *Trade-off for MPA Design* (Trade-off for MPA Design)
- *Participatory mapping* (Trade-off for MPA Design)

ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea

Criteria classes: *1.1.1 Vulnerability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas*

Criteria

- Category *Socio–economic & governance criteria*
  - Subcategory *Socio–economic criteria*
    - Criteria *Area important because it allows access to relevant areas for the marine users.*
    - Criteria *Area important for locally-caught seafood*
    - Criteria *Area important for the generation of employment and income linked to non traditional activities*
    - Criteria *Area important for fishery activity*
    - Criteria *Area important for dredging*
  - Subcategory *Governance criteria*
    - Criteria *Equity*
    - Criteria *Cross-border cooperation*
- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Functional hotspots*
    - Macro-criterion *Life cycle critical areas*

Implementation details

Generally near-term question, generally coastal question where activities are concentrated or on key areas such as seamounts on deep-sea.

Step 1: Consider the type of conflicts you would like to asses (spatial, ressources, acceptance)

Step 2: Map areas of conservation relevance (already identified or based on scientific knowledge) where regulation will potentially change, identify strict areas of protection and map areas of anthropogenic pressure. Identify areas of overlapping between future projects and anthropogenic activities. Identify areas of concentration of uses where conflicts have the highest probability to arise.

Step 3: Participatory mapping

Step 4: Confront the resultat of participatory mapping and of internal mapping and propose different scenarios of potential MPA extension. Consider different levels of ambition.

Step 5: Analyse acceptance, particularly for the activities the most impacted. Public consultations.

Please refer to the answers to similar questions 11 and 53 for more information on the topic.

ESE2 - Criteria for the representation of the social and economic dimension of MPAs

Spatial scales: National Regional / local

ESE3 - Trade-offs method for protections and restoration in MSP

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Operational approaches: *(Method) Trade-off for MPA Design (Method) Participatory mapping*

Implementation details

Use of the Guidelines for applying trade-off methodology for MPA design (Figure 4) from Deliverable 4.3 "Trade-offs method for protection and restoration in MSP", including all annexes.

In the methodology, during the scope of Building a project in the Participatory Mapping Tool, some specific questions could be designed to identify conflict areas, areas relevant to conservation, and potential areas for activity expansion, among others relevant to your interest area.

The use of Annexe 02 - Portfolio of Arguments can support discussion to ensure economic interests and maintain MPAs objectives.

Notes

More information at: Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Offshore zone

Criteria classes: *5.1 Socio–economic criteria*

Criteria

- Category *Socio–economic & governance criteria*
  - Subcategory *Socio–economic criteria*
    - Criteria *Area important because it allows access to relevant areas for the marine users.*
    - Criteria *Area important for locally-caught seafood*
    - Criteria *Area important for the generation of employment and income linked to non traditional activities*
    - Criteria *Area important for fishery activity*
    - Criteria *Area important for dredging*
    - Criteria *Area important because of the presence of structure with significant historical and cultural. (mo*
    - Criteria *Area of high scientific interest*
    - Criteria *Area important for educational interest*
    - Criteria *Area important because of the occurrence of iconic species/habitats for the local community*
    - Criteria *Area important for thehealth of coastal residents and/or resource users (mental health, physical hea*
    - Criteria *Area important due to the socio-cultural dependence of the coastal community with its environ*
    - Criteria *Area important to be managed due to the presence ofspatial conflicts among users*
    - Criteria *Area important because of the presence of cultural symbolic value*
    - Criteria *Area important for recreation and leisure*
    - Criteria *Area important because of the presence of cultural and tradition activities that support local fo*
    - Criteria *Area important for traditional human settlement, land-use, or sea-use which is representative of*
    - Criteria *Area with high scenic and/or aesthetic value*
    - Criteria *Area important for shipping*
    - Criteria *Area is important for the development of blue economy activities*
    - Criteria *Area with current/potential importance to explore and demonstrate approaches and management solution*

7.28.2 Measures

ESE3 - Nature-inclusive operation of blue economy sectors

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone Deep sea Offshore zone

Measures: *Aquaculture - Regional Collaboration - Local knowledge Aquaculture - Integrated Multi-Trophic Aquaculture - Educational awareness Aquaculture - Artisanal Fish Farming Commitments - Code of Good Practice Aquaculture - Artisanal Fish Farming Commitments - Agreement among artisanal fish farming Aquaculture - General Planning Rules based on - Ecosystem Service Tools Marine non-living resources - Deep-sea Mining - Circular Economy Marine non-living resources - Importance of EMS Data - Voluntary Initiative for Information Sharing Offshore renewable energy - Socio economic (for both) - Implement effective monitoring practices Offshore renewable energy - Socio economic (for both) - Facilitate stakeholder engagement Fishery - "Who is allowed to fish" - Cultural and Community Approaches/Practices - Criteria for fishing permissions Fishery - "Who is allowed to fish" - Cultural and Community Approaches/Practices - Involvement of local communities Fishery - Sustainable Approachs/Practices - Notify authority in advance Fishery - "Who is allowed to fish" - Cultural and Community Approaches/Practices - Membership of fishing cooperative Fishery - "Who is allowed to fish" - Cultural and Community Approaches/Practices - Fisheries management recognizing traditional knowledge Aquaculture - Community-Based Contracts - Collaborative farming initiatives*

Measures details

For cumulative impact assessment, check the pressures on Ecosystem Services of each activity for the sector (Aquaculture, Fishery, Tourism, Non-living Marine Resources, Renewables) (Pegorelli et al. 2024)

Notes

More information at:

Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

7.29 Q 11 - How to integrate socio-econonomic objectives in assessment of existing MPA (network) and identification of new MPAs?

Narrower "Questions"

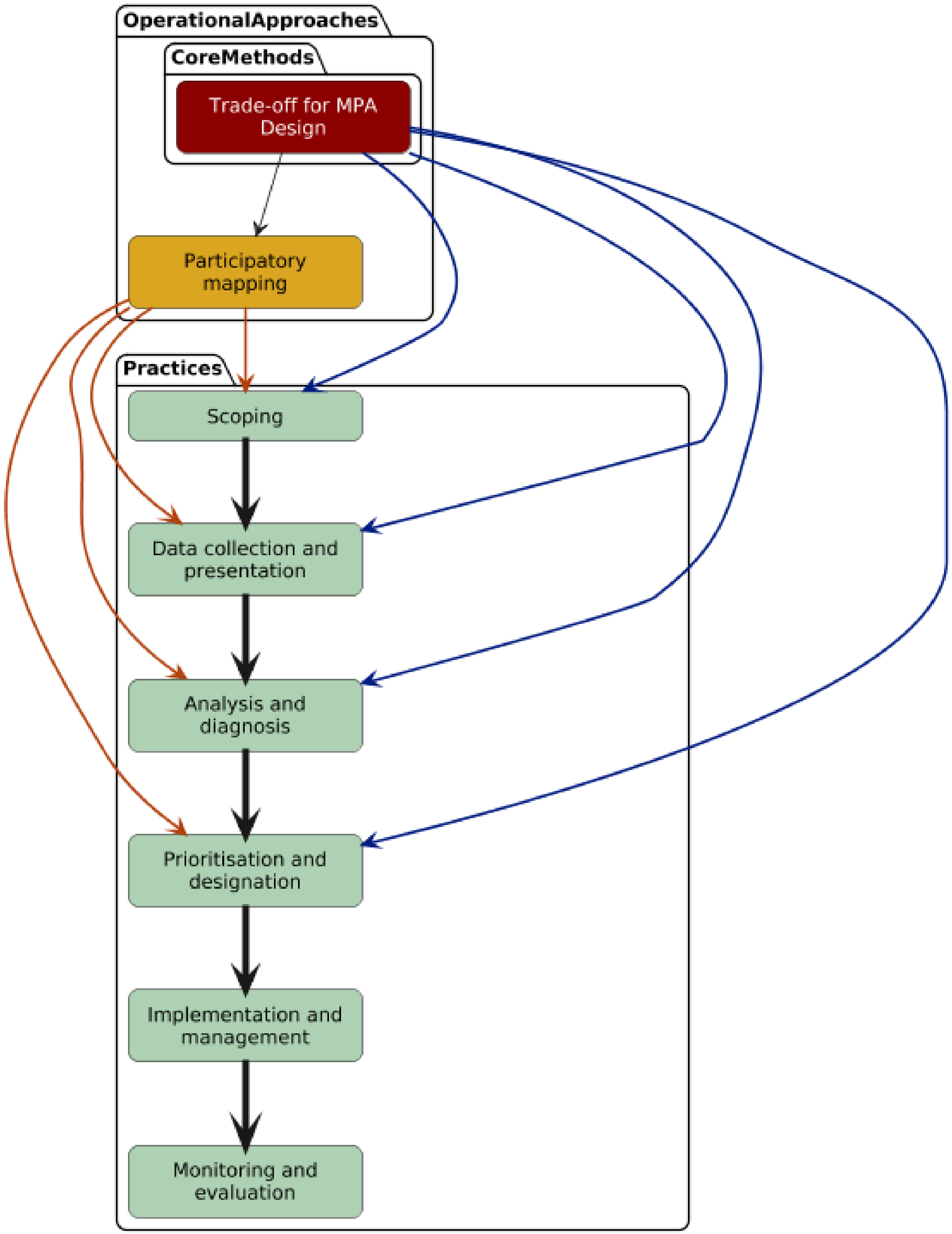
- *Q 46 - Hot to identify compensation measures and how to assess their effectiveness?*
- *Q 45 - How to assess economic impacts of conservation measures?*
- *Q 13 - How to evaluate trade-offs in MSP and MPA designation process?*

Related sites

- *Baltic Sea basin and Vistula Lagoon/Southern Baltic*
- *Western Black Sea*
- *Azores Archipelago*

Source   Matczak et al. (2024) Test Sites Methodology Including the Participation Strategy (Deliverable – D5.2., under the WP5 of MSP4BIO project (GA n° 101060707))

7.29.1 Answers



Operational approaches

- *Trade-off for MPA Design* (Trade-off for MPA Design)

- *Participatory mapping* (Trade-off for MPA Design)

ESE1 - Ecological toolkit

Practices: *Scoping Analysis and diagnosis Prioritisation and designation Implementation and management*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone Deep sea Offshore zone

Implementation details

From an ecological point of view, socio-economic objectives need to be integrated both in scoping phase and the design phase of MPA. It is included through the prioritization of objectives in the scoping phase as the ecological services and human pressures are the first criteria used to define ecological management target (c.f. MPA management plans). Then, in the trade-off analysis they are particularly important to prioritise scenarios because no management plan can be a success without compliance and stakeholders engagement. In general, reaching the Good Ecological Status (GES) is possible only if the human component of the MPA is healthy and stable. Moreover, it is important to identify synergies between socio-economic and ecological objectives to maximise the results of the protection.

ESE2 - Criteria for the representation of the social and economic dimension of MPAs

Practices: *Scoping*

Criteria

- Category *Socio–economic & governance criteria*
  - Subcategory *Socio–economic criteria*
    - Criteria *Area important because it allows access to relevant areas for the marine users.*
    - Criteria *Area important for locally-caught seafood*
    - Criteria *Area important for the generation of employment and income linked to non traditional activities*
    - Criteria *Area important for fishery activity*
    - Criteria *Area important for dredging*
    - Criteria *Area important because of the presence of structure with significant historical and cultural. (mo*
    - Criteria *Area of high scientific interest*
    - Criteria *Area important for educational interest*
    - Criteria *Area important because of the occurrence of iconic species/habitats for the local community*
    - Criteria *Area important for thehealth of coastal residents and/or resource users (mental health, physical hea*
    - Criteria *Area important due to the socio-cultural dependence of the coastal community with its environ*
    - Criteria *Area important to be managed due to the presence ofspatial conflicts among users*

    * Criteria *Area important because of the presence of cultural symbolic value*
    * Criteria *Area important for recreation and leisure*
    * Criteria *Area important because of the presence of cultural and tradition activities that support local fo*
    * Criteria *Area important for traditional human settlement, land-use, or sea-use which is representative of*
    * Criteria *Area with high scenic and/or aesthetic value*
    * Criteria *Area important for shipping*
    * Criteria *Area is important for the development of blue economy activities*
    * Criteria *Area with current/potential importance to explore and demonstrate approaches and management solution*
  - Subcategory *Governance criteria*
    * Criteria *Equity*
    * Criteria *Clear strategic plan for the development of sustainable blue economy*
    * Criteria *Cross-border cooperation*
    * Criteria *Decision making is based on best information and knowledge available*
    * Criteria *Monitoring and evaluation*
    * Criteria *Instruments to ensure and guide development and implementation of marine policies*
    * Criteria *Sustainable fishing management*
    * Criteria *Long term strategic adaptive management*
    * Criteria *Coherence management of the area*
    * Criteria *Stakeholder participation*

Notes

More information at:

Pegorelli et al. (2023). Criteria for the representation of the social and economic dimension of MPAs (Deliverable – D4.1., under the WP4 of MSP4BIO project (GA n° 101060707)).

ESE2 - Criteria for the representation of the social and economic dimension of MPAs

Practices: *Scoping*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Criteria classes: *5 Socio–economic & governance criteria 5.1 Socio–economic criteria 5.1.1 Blue Economy 5.1.2 Culture 5.1.3 Human wellbeing 5.1.4 Education and science 5.2 Governance criteria 5.2.1 Strategic management 5.2.2 Planning 5.2.3 Information, knowledge and evaluation*

Criteria

- Category *Socio–economic & governance criteria*
  - Subcategory *Socio–economic criteria*
    - Criteria *Area important for locally-caught seafood*
    - Criteria *Area important for fishery activity*
    - Criteria *Area important because of the presence of structure with significant historical and cultural. (mo*
    - Criteria *Area of high scientific interest*
    - Criteria *Area important for educational interest*
    - Criteria *Area important because of the occurrence of iconic species/habitats for the local community*
    - Criteria *Area important for thehealth of coastal residents and/or resource users (mental health, physical hea*
    - Criteria *Area important due to the socio-cultural dependence of the coastal community with its environ*
    - Criteria *Area important to be managed due to the presence ofspatial conflicts among users*
    - Criteria *Area important because of the presence of cultural symbolic value*
    - Criteria *Area important for recreation and leisure*
    - Criteria *Area important because of the presence of cultural and tradition activities that support local fo*
    - Criteria *Area important for traditional human settlement, land-use, or sea-use which is representative of*
    - Criteria *Area with high scenic and/or aesthetic value*
    - Criteria *Area important for shipping*
    - Criteria *Area is important for the development of blue economy activities*
    - Criteria *Area with current/potential importance to explore and demonstrate approaches and management solution*
    - Macro-criterion *Blue Economy*
    - Macro-criterion *Culture*
    - Macro-criterion *Human wellbeing*
    - Macro-criterion *Education and science*
  - Subcategory *Governance criteria*
    - Criteria *Equity*
    - Criteria *Clear strategic plan for the development of sustainable blue economy*
    - Criteria *Cross-border cooperation*
    - Criteria *Decision making is based on best information and knowledge available*
    - Criteria *Strategic Environmental Assessment*
    - Criteria *Monitoring and evaluation*

* Criteria *Instruments to ensure and guide development and implementation of marine policies*
* Criteria *Sustainable fishing management*
* Criteria *Ecosystem based management approach*
* Criteria *Long term strategic adaptive management*
* Criteria *Coherence management of the area*
* Criteria *Stakeholder participation*
* Macro-criterion *Strategic management*
* Subcategory *Planning*
* Macro-criterion *Information, knowledge and evaluation*

ESE3 - Trade-offs method for protections and restoration in MSP

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: National Regional / local
Protection regimes: Strict protection Non-strict protection

Criteria classes: *5.1 Socio–economic criteria*

Criteria

- Category *Socio–economic & governance criteria*
  - Subcategory *Socio–economic criteria*
    * Criteria *Area important because it allows access to relevant areas for the marine users.*
    * Criteria *Area important for locally-caught seafood*
    * Criteria *Area important for the generation of employment and income linked to non traditional activities*
    * Criteria *Area important for fishery activity*
    * Criteria *Area important for dredging*
    * Criteria *Area important because of the presence of structure with significant historical and cultural. (mo*
    * Criteria *Area of high scientific interest*
    * Criteria *Area important for educational interest*
    * Criteria *Area important because of the occurrence of iconic species/habitats for the local community*
    * Criteria *Area important for thehealth of coastal residents and/or resource users (mental health, physical hea*
    * Criteria *Area important due to the socio-cultural dependence of the coastal community with its environ*
    * Criteria *Area important to be managed due to the presence ofspatial conflicts among users*
    * Criteria *Area important because of the presence of cultural symbolic value*
    * Criteria *Area important for recreation and leisure*

    * Criteria *Area important because of the presence of cultural and tradition activities that support local fo*
    * Criteria *Area important for traditional human settlement, land-use, or sea-use which is representative of*
    * Criteria *Area with high scenic and/or aesthetic value*
    * Criteria *Area important for shipping*
    * Criteria *Area is important for the development of blue economy activities*
    * Criteria *Area with current/potential importance to explore and demonstrate approaches and management solution*
  - Subcategory *Governance criteria*
    * Criteria *Equity*
    * Criteria *Clear strategic plan for the development of sustainable blue economy*
    * Criteria *Cross-border cooperation*
    * Criteria *Decision making is based on best information and knowledge available*
    * Criteria *Monitoring and evaluation*
    * Criteria *Instruments to ensure and guide development and implementation of marine policies*
    * Criteria *Sustainable fishing management*
    * Criteria *Long term strategic adaptive management*
    * Criteria *Coherence management of the area*
    * Criteria *Stakeholder participation*

Operational approaches: *(Method) Trade-off for MPA Design (Method) Participatory mapping*

Implementation details

Use of the Guidelines for applying trade-off methodology for MPA design (Figure 4) from Deliverable 4.3 "Trade-offs method for protection and restoration in MSP", including all annexes.

Notes

Use of the method Trade-off for MPA Design.

Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

7.29.2 Measures

ESE3 - Nature-inclusive operation of blue economy sectors

Practices: *Implementation and management*
Spatial scales: National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Measures: *Aquaculture - Regional Collaboration - Local knowledge Aquaculture - Community-Based Contracts - Sea Garden Community Aquaculture - Integrated Multi-Trophic Aquaculture - Educational awareness Aquaculture - Artisanal Fish Farming Commitments - Code of Good Practice Aquaculture - Artisanal Fish Farming Commitments - Agreement among artisanal fish farming Aquaculture - General Planning Rules based* *on - Ecosystem Service Tools Marine non-living resources - Seabed Mapping and Archaeological Considerations - Seabed mapping Marine non-living resources - Seabed Mapping and Archaeological Considerations - Exclusion zones in archaeological features Marine non-living resources - Deep-sea Mining - Circular Economy Marine non-living resources - Seabed Mapping and Archaeological Considerations - Protocols of safe operation Offshore renewable energy - Socio economic (for both) - Implement effective monitoring practices Fishery - Sustainable Approachs/Practices - Fishing practices limits Offshore renewable energy - Socio economic (for both) - Optimize land use Offshore renewable energy - Socio economic (for both) - Facilitate stakeholder engagement Fishery - "Who is allowed to fish" - Cultural and Community Approaches/Practices - Criteria for fishing permissions Fishery - Temporal Approaches/Practices - Changes in permitted activities Fishery - "Who is allowed to fish" - Cultural and Community Approaches/Practices - Involvement of local communities Fishery - "Who is allowed to fish" - Cultural and Community Approaches/Practices - Membership of fishing cooperative Fishery - "Who is allowed to fish" - Cultural and Community Approaches/Practices - Fisheries management recognizing traditional knowledge Fishery - "Who is allowed to fish" - Cultural and Community Approaches/Practices - Industrial fishery restrictions Aquaculture - Community-Based Contracts - Collaborative farming initiatives*

Notes

More information at:

Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

7.30 Q 46 - Hot to identify compensation measures and how to assess their effectiveness?

Broader "Question"

- *Q 11 - How to integrate socio-econonomic objectives in assessment of existing MPA (network) and identification of new MPAs?*

Related sites

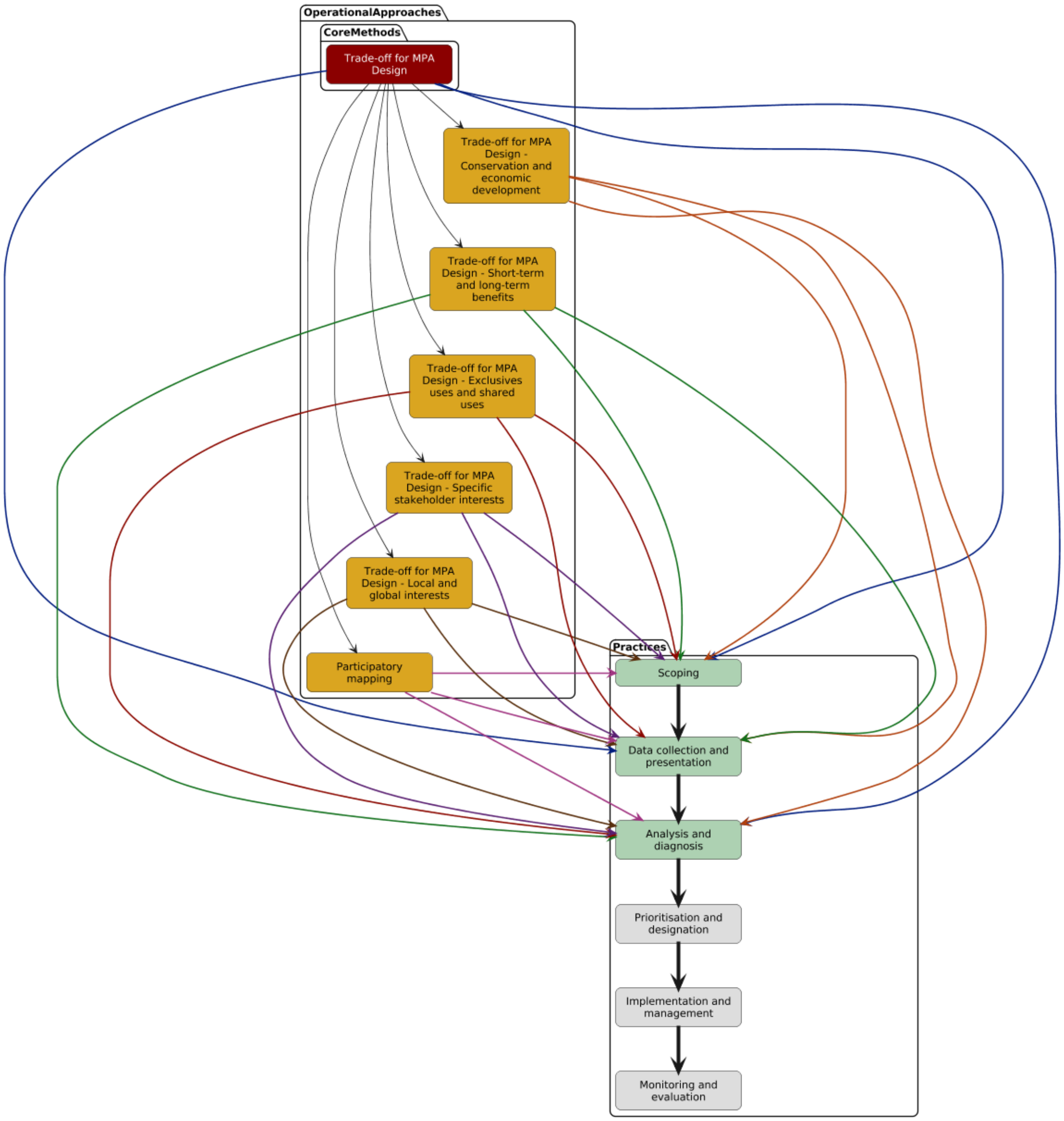
- *Western Black Sea*

7.30.1 General answer

From an environmental perspective, compensation measures are actions that try to counterbalance residual negative impacts of projects. The aim to protect, enhance, restore or otherwise improve the damaged or scarce resources. Compensation measures must meet the following characteristics: - to relate to the species(ies) and/or habitat(s) for which the impact has been identified; - to counterbalance the damage caused; - to respect as far as possible a principle of proximity when this is justified; - to be accompanied by clear and precise specifications for the implementation; - to be operational when the negative impact becomes effective. (Ref. Anders Enetjärn, Scott Cole, Matleena Kniivilä, Svein Erik Hårklau, Linus Hasselström, Tryggve Sigurdson and Johan Lindberg, 2015. Environmental compensation - Key conditions for increased and cost-effective application. http://dx.doi.org/10.6027/TN2015-572 Nordic Council of Ministers 2015)

Assessing the economic impacts of conservation measures involves systematically evaluating both direct and indirect effects on local economies and broader financial systems. Key methods include Cost-Benefit Analysis (CBA) to quantify costs and benefits, Ecosystem Services Valuation to assign economic values, Input-Output Analysis to estimate local economic effects, and Social Impact Assessment to evaluate community impacts. Comparative studies help track changes in economic indicators over time, complemented by stakeholder engagement through surveys (ESE3). Longitudinal studies allow for trend analysis, while adaptive management practices ensure findings inform ongoing conservation strategies. These comprehensive approaches enable stakeholders to gain insights into the economic impacts of conservation initiatives, facilitating effective decision-making processes.

7.30.2 Answers



Operational approaches

- *Trade-off for MPA Design* (Trade-off for MPA Design)
- *Trade-off for MPA Design - Conservation and economic development* (Trade-off for MPA Design)
- *Trade-off for MPA Design - Short-term and long-term benefits* (Trade-off for MPA Design)
- *Trade-off for MPA Design - Exclusives uses and shared uses* (Trade-off for MPA Design)
- *Trade-off for MPA Design - Specific stakeholder interests* (Trade-off for MPA Design)
- *Trade-off for MPA Design - Local and global interests* (Trade-off for MPA Design)
- *Participatory mapping* (Trade-off for MPA Design)

ESE3 - Trade-offs method for protections and restoration in MSP

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone Deep sea Offshore zone

Operational approaches: *(Method) Trade-off for MPA Design (Method) Trade-off for MPA Design - Conservation and economic development (Method) Trade-off for MPA Design - Short-term and long-term benefits (Method) Trade-off for MPA Design - Exclusives uses and shared uses (Method) Trade-off for MPA Design - Specific stakeholder interests (Method) Trade-off for MPA Design - Local and global interests (Method) Participatory mapping*

Implementation details

There are Compesantory measures on page 109, in annexe 02 - Portfolio of Arguments, which can support discussion to ensure economic interests and maintain MPAs objectives.

Stakeholder engagement and Participatory Mapping to collect data for economic data, and identifying specific impacts. Use of Annexe 5 - Table Participatory Mapping Tool. From Deliverable 4.3 “Trade-offs method for protection and restoration in MSP”

Notes

More information at: Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

7.31 Q 45 - How to assess economic impacts of conservation measures?

Broader “Question”

- *Q 11 - How to integrate socio-econonomic objectives in assessment of existing MPA (network) and identification of new MPAs?*

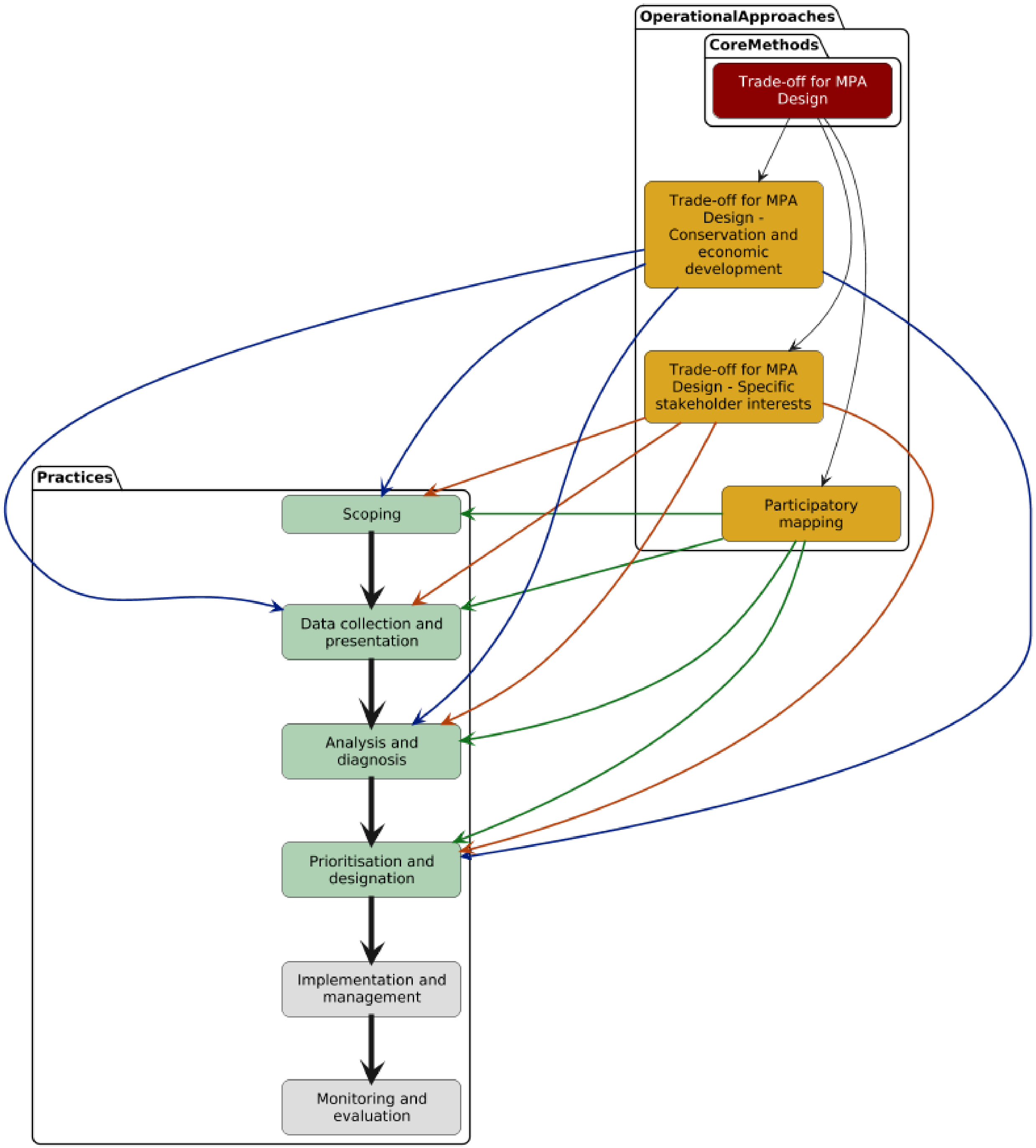
Related sites

- *Western Black Sea*

7.31.1 General answer

Assessing the economic impacts of conservation measures requires a systematic approach that encompasses both direct and indirect effects on local economies and broader financial systems. Key methods include conducting a Cost-Benefit Analysis (CBA) to quantify costs and benefits, Valuation of Ecosystem Services to assign economic values, and Input-Output Analysis to understand the ripple effects on local economies. Furthermore, Social Impact Assessments evaluate the effects on local communities, while comparative studies and longitudinal studies help track economic indicators over time. Engaging stakeholders through surveys enriches the data collection process, and integrating findings into an adaptive management framework allows for ongoing adjustments based on economic feedback. Together, these approaches provide a comprehensive understanding of the financial impacts, facilitating informed decision-making regarding conservation initiatives.

7.31.2 Answers



Operational approaches

- *Trade-off for MPA Design - Conservation and economic development* (Trade-off for MPA Design)
- *Trade-off for MPA Design - Specific stakeholder interests* (Trade-off for MPA Design)
- *Participatory mapping* (Trade-off for MPA Design)

ESE3 - Trade-offs method for protections and restoration in MSP

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone Deep sea Offshore zone

Operational approaches: *(Method) Trade-off for MPA Design - Conservation and economic development (Method) Trade-off for MPA Design - Specific stakeholder interests (Method) Participatory mapping*

Implementation details

The use of Annexe 02 - Portfolio of Arguments can support discussion to ensure economic interests and maintain MPAs objectives, can provide some examples of compensatory methods. Mainly through stakeholder engagement and Participatory Mapping to collect data for socio-economic impact analysis. Use of Annexe 5 - Table Participatory Mapping Tool. From Deliverable 4.3 "Trade-offs method for protection and restoration in MSP"

Notes

More information at: Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

7.32 Q 13 - How to evaluate trade-offs in MSP and MPA designation process?

Broader "Question"

- *Q 11 - How to integrate socio-econonomic objectives in assessment of existing MPA (network) and identification of new MPAs?*

Related sites

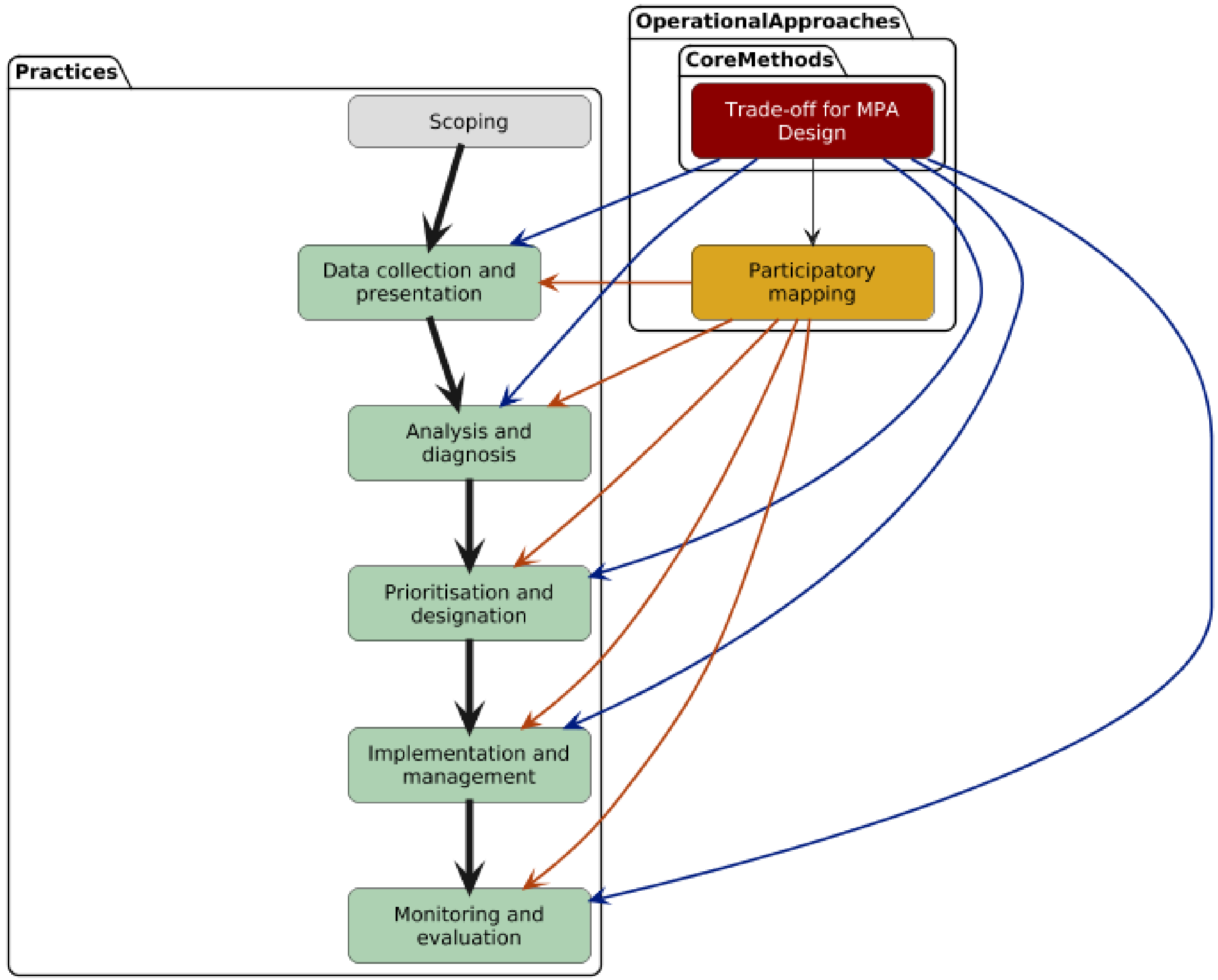
- *Western Black Sea*

7.32.1 General answer

Evaluating trade-offs in the Maritime Spatial Planning (MSP) and Marine Protected Area (MPA) designation process is vital for harmonising ecological, economic, and social goals. This can be effectively achieved by engaging diverse stakeholders to uncover differing interests (e.g. Participatory Mapping), employing Multi-Criteria Decision Analysis (MCDA) to quantify and balance alternatives, and utilising scenario planning to visualise potential outcomes. Assessing ecosystem services helps illuminate conservation benefits, while detailed cost-benefit analyses provide a comprehensive view of the impacts. Adopting adaptive management practices ensures ongoing reassessment of decisions, and clear communication fosters informed stakeholder participation. By integrating these methods, planners can navigate trade-offs effectively and promote sustainable marine management outcomes.

Source Matczak et al. (2024) Test Sites Methodology Including the Participation Strategy (Deliverable – D5.2., under the WP5 of MSP4BIO project (GA n° 101060707))

7.32.2 Answers



Operational approaches

- *Trade-off for MPA Design* (Trade-off for MPA Design)
- *Participatory mapping* (Trade-off for MPA Design)

ESE3 - Nature-inclusive operation of blue economy sectors

ESE3 - Trade-offs method for protections and restoration in MSP

Practices: *Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection

Criteria classes: *5 Socio–economic & governance criteria*

Criteria

- Category *Socio–economic & governance criteria*
  - Subcategory *Socio–economic criteria*
    - Criteria *Area important because it allows access to relevant areas for the marine users.*
    - Criteria *Area important for locally-caught seafood*
    - Criteria *Area important for the generation of employment and income linked to non traditional activities*
    - Criteria *Area important for fishery activity*
    - Criteria *Area important for dredging*
    - Criteria *Area important because of the presence of structure with significant historical and cultural. (mo*
    - Criteria *Area of high scientific interest*
    - Criteria *Area important for educational interest*
    - Criteria *Area important because of the occurrence of iconic species/habitats for the local community*
    - Criteria *Area important for thehealth of coastal residents and/or resource users (mental health, physical hea*
    - Criteria *Area important due to the socio-cultural dependence of the coastal community with its environ*
    - Criteria *Area important to be managed due to the presence ofspatial conflicts among users*
    - Criteria *Area important because of the presence of cultural symbolic value*
    - Criteria *Area important for recreation and leisure*
    - Criteria *Area important because of the presence of cultural and tradition activities that support local fo*
    - Criteria *Area important for traditional human settlement, land-use, or sea-use which is representative of*
    - Criteria *Area with high scenic and/or aesthetic value*
    - Criteria *Area important for shipping*
    - Criteria *Area is important for the development of blue economy activities*
    - Criteria *Area with current/potential importance to explore and demonstrate approaches and management solution*
  - Subcategory *Governance criteria*
    - Criteria *Equity*
    - Criteria *Clear strategic plan for the development of sustainable blue economy*
    - Criteria *Cross-border cooperation*
    - Criteria *Decision making is based on best information and knowledge available*
    - Criteria *Strategic Environmental Assessment*
    - Criteria *Monitoring and evaluation*

    * Criteria *Instruments to ensure and guide development and implementation of marine policies*
    * Criteria *Sustainable fishing management*
    * Criteria *Climate change measures established*
    * Criteria *Ecosystem based management approach*
    * Criteria *Long term strategic adaptive management*
    * Criteria *Coherence management of the area*
    * Criteria *Stakeholder participation*

Operational approaches: *(Method) Trade-off for MPA Design (Method) Participatory mapping*

Implementation details

Use of the Guidelines for applying trade-off methodology for MPA design (Figure 4) from Deliverable 4.3 “Trade-offs method for protection and restoration in MSP”, including all annexes.

For participatory tools, use Annexe 5 - Table Participatory Mapping Tool. From Deliverable 4.3 “Trade-offs method for protection and restoration in MSP”

For Multi-Criteria Decision Analysis, you may check page 89 under Ecosystem Services and Trade-off Analysis in MSP.

Notes

Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

7.32.3 Measures

ESE3 - Nature-inclusive operation of blue economy sectors

ESE3 - Trade-offs method for protections and restoration in MSP

Practices: *Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

Spatial scales: Transboundary / sea basin National Regional / local

7.33 Q 16 - How to prioritize areas for conservation (designation of new MPAs)?

Narrower “Questions”

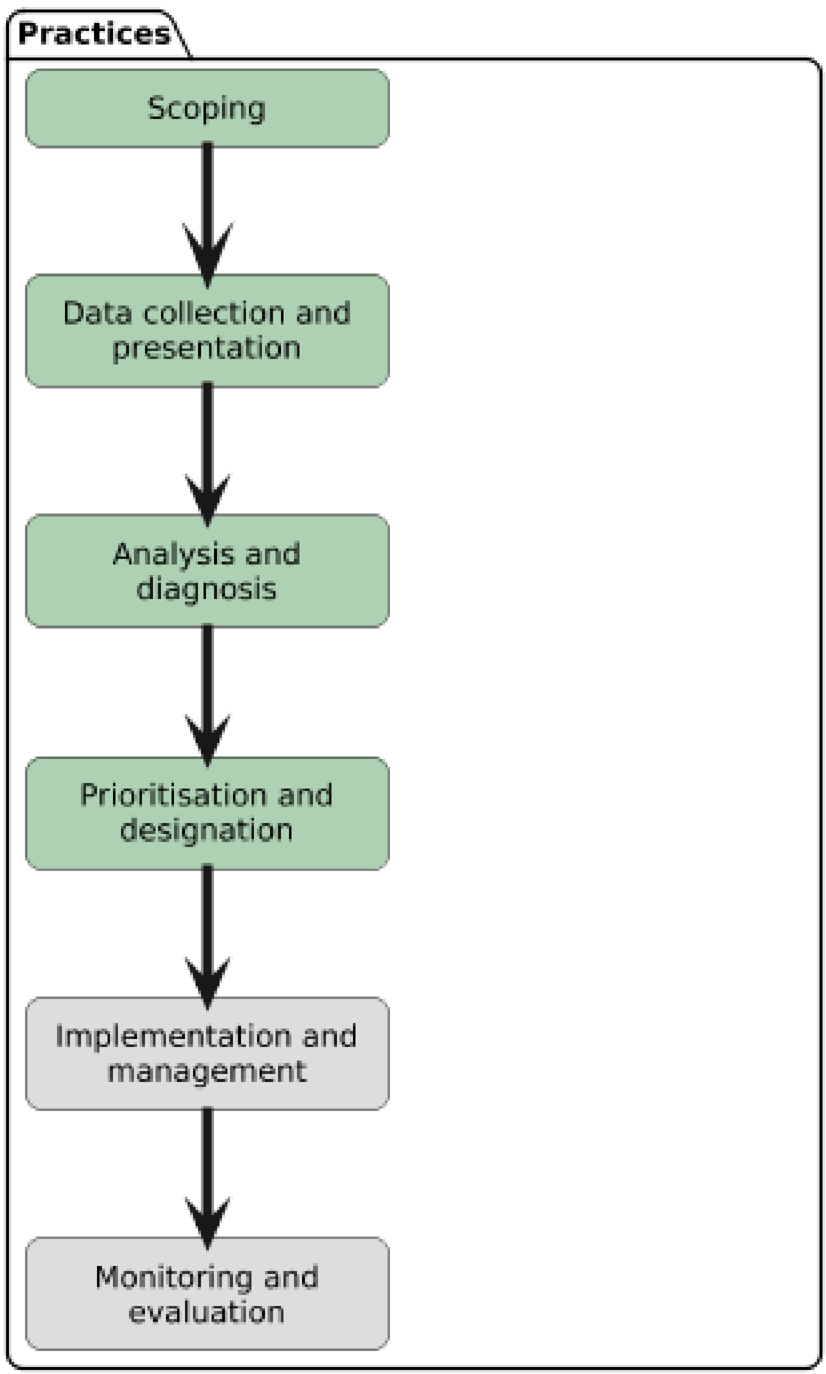
- *Q 17 - How to identify priority areas for conservation of pelagic biodiversity?*
- *Q 18 - How to identify priority areas for preserving/restoring reef-forming species such as oysters Lanice conchilega or mussels?*
- *Q 37 - How to maintain local retention / population persistence within the MPA?*
- *Q 36 - How to maintain mobile species persistence (and connectivity) and population/community persistence (passive connectivity) across a transboundary MPA?*
- *Q 58 - How to protect vulnerable species against climatic stressors?*

- *Q 33 - What are the environmental legislation/criteria guidance for MPA designation including socio-economic criteria (Commission's SWD, EU Directives, IUCN, new criteria UNCLOS?)*

Related sites

- *Western Black Sea*
- *Belgian part of the North Sea*

7.33.1 Answers



ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Criteria classes: *1.1 Functional 1.1.1 Vulnerability 1.1.2 Stability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas 1.1.5 Climate-smart potential 1.2 Structural 1.3 Genetic 1.4 Ecological status*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Stability*
    - Macro-criterion *Functional hotspots*
    - Macro-criterion *Life cycle critical areas*
    - Macro-criterion *Climate-smart potential*
  - Subcategory *Structural*
  - Subcategory *Genetic*
  - Subcategory *Ecological status*

Implementation details

To answer this question, we highly recommend to read the guidance inclusive of anthropogenic and climatic stressors as driver of changes (CAMBRA et al,. 2024). The following criteria of Kotta et al., 2024 are also particularly relevant to support the process: Stability, Functional hotspots, Life-cycle critical areas to identify areas of conservation priority (e.g., refuge areas, feeding areas and nurseries grounds, key functionnal areas with high level of functional diversity). Example of priority areas includes Ecologically and Biologically Significant Areas (EBSAs) and Vulnerable Marine Ecosystems (VME) areas.

- Step 1: Define the conservation objectives (target (D3.3 - chapter2), pathways (D3.3 - 5.2.2)) and hierarchized them based on local context (including social, economical and ecological component), conventions objectives and feasability (regarding Data and difficulty to reach a trad-off among users). In this step you also need to define the complexity of analysis to perform by eventually hierarchising the degree on which you will try to interconnect social, econonomical and ecological component. In the conservation pathways, ecological issues should be the focus before sociological and economical component but the final balance depends on the objectives defined.
- Step 2: Perform an analysis of risk (step 2 to 5 of the Guidance)
- Step 3: Propose different MPA network designs with connectivity as one of the main consideration in the design. You can be supported in the designation process by the chater 6 of the D3.4 in which you can find a list of criteria to define climate-smart MPA and MPA networks.
- Step 4: Enter in the Trade-off process (cf ESE3)

Notes

Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

16 - How to prioritize areas for conservation (designation of new MPAs)?

7.34 Q 17 - How to identify priority areas for conservation of pelagic biodiversity?

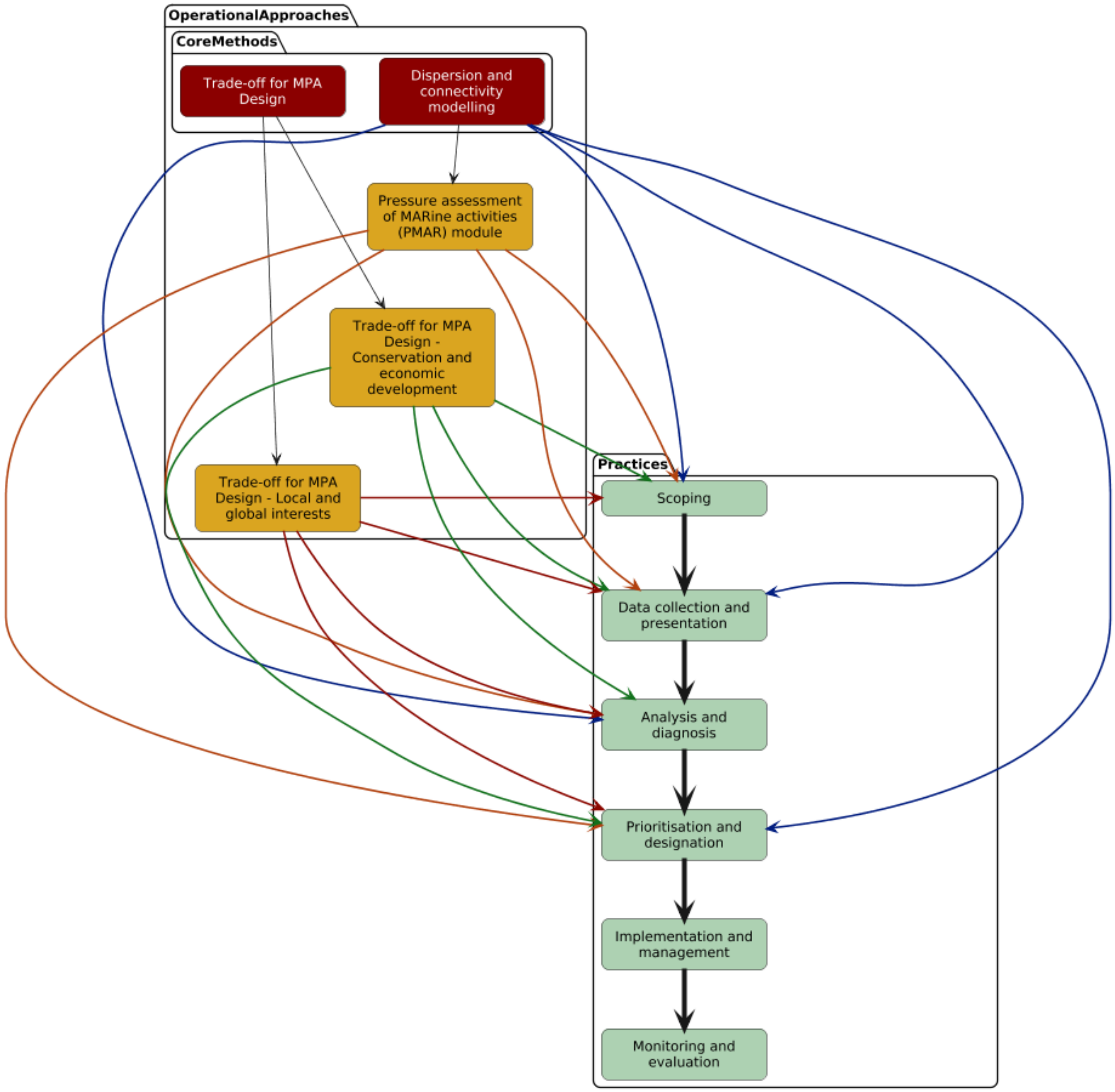
Broader "Question"

- *Q 16 - How to prioritize areas for conservation (designation of new MPAs)?*

Related sites

- *Belgian part of the North Sea*
- *North-Western Mediterranean (NW-MED)*

7.34.1 Answers



Operational approaches

- *Dispersion and connectivity modelling* (Dispersion and connectivity modelling)
- *Pressure assessment of MARine activities (PMAR) module* (Dispersion and connectivity modelling)
- *Trade-off for MPA Design - Conservation and economic development* (Trade-off for MPA Design)
- *Trade-off for MPA Design - Local and global interests* (Trade-off for MPA Design)

ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Non-strict protection
Marine zones: Offshore zone

Criteria classes: *1 Ecological and genetic criteria 1.1 Functional 1.1.1 Vulnerability 1.1.2 Stability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas 1.1.5 Climate-smart potential 1.2 Structural 1.3 Genetic*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Life cycle critical areas*
      - Criteria *Developmental and feeding/foraging habitats/areas*
      - Criteria *Ecological corridors/migration routes*
      - Criteria *Nursery and breeding grounds*
      - Criteria *Larval sources and spawning aggregation areas*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Stability*
    - Macro-criterion *Functional hotspots*
    - Macro-criterion *Climate-smart potential*
  - Subcategory *Structural*
  - Subcategory *Genetic*

Operational approaches: *(Method) Dispersion and connectivity modelling (Tool) Pressure assessment of MARine activities (PMAR) module (Method) Trade-off for MPA Design - Conservation and economic development (Method) Trade-off for MPA Design - Local and global interests*

Implementation details

This question refers to the question 52: "How to protect pelagic habitats", we highly recommend to read carefully that answer for more details.

Priority area for conservation of pelagic biodiversity should be areas where the functionality will be maintained under the changing conditions (climate-refugia or adaptive areas, see CAMBRA et al., 2024) and the future productive areas for the pelagic ecosystems. To protect pelagic habitats it is so highly consider to monitor and project the future upwelling areas and plankton dynamics.

According to the ESE, priority areas are considered under: - Functionally important areas (Functional hotspots macro-criterion): presence of key functional species such as apex predators or primary producers and areas that are vulnerable and considered a priority for conservation due to their functional importance in the marine (e.g. Vulnerable Marine Ecosystems, VMEs like corals and their role as habitat forming species for which many other species depend on). - Critical areas for the life cycle of species that undertake a pelagic phase (i.e. macro-criterion Life cycle critical areas, e.g. larval source and sink areas, steppingstone areas, refuge areas, migratory corridors, feeding grounds for cetaceans) should be considered a priority as these species depend on these areas to survive. For this, the use of techniques such as observations, eDNA and satellite monitoring (e.g. phytoplankton blooms, fishing/trade vessel activity for example to investigate shipping strikes on cetaceans) and tagging can aid in the identification of priority areas for the conservation of pelagic biodiversity. Vulnerable Marine Ecosystems (VMEs) and Ecologically or Biologically Significant Areas (EBSAs) also provide criteria that can guide the conservation of pelagic species/habitats. - Connectivity areas as connectivity being intertwined in efforts to conserve pelagic biodiversity, please find further classifications of connectivity and their associated metrics and tools in Chapter/Section 4 of D3.1 "Critical review on multilevel ecological processes to improve systemic biodiversity protection and restoration strategies in Europe" and Section 3.2.4 of D3.2 "Portfolio of improved ecological criteria to be applied in systemic biodiversity protection and restoration".

MSPdF Classification: *Marine & Coastal Environment Marine & Coastal Environment -> Descriptor/Criteria: D1 Biodiversity - birds Marine & Coastal Environment -> Descriptor/Criteria: D1 Biodiversity - pelagic habitats Marine & Coastal Environment -> Descriptor/Criteria: D1C4 Population distributional range and pattern Marine & Coastal Environment -> Descriptor/Criteria: D1C6 Pelagic habitat condition Marine & Coastal Conservation and Designated sites: Nationally designated Protected Areas (marine and coastal) Marine & Coastal Conservation and Designated sites: Recognised areas of protection/conservation value Maritime Activities and MSP: Professional fishing Maritime Activities and MSP: Recreational fishing Maritime Activities and MSP: Protected areas*

Notes

Bongiorni L et al (2023) Critical review on multilevel ecological processes to improve systemic biodiversity protection and restoration strategies in Europe. Deliverable – D3.1., under the WP2 of MSP4BIO project (GA n° 101060707)

Bongiorni L., Bekaert M., Jusufovski D., Bocci M., Gissi E., Magaldi M., Sciascia R., Rombouts I., Costa A., Barbanti A., Pınarbaşı K., Withouck I., Kotta J., Whatley L., Barboza F.R. (2023) Portfolio of improved ecological criteria to be applied in biodiversity protection and restoration for project testing sites. Deliverable – D3.2., under the WP3 of MSP4BIO project (GA n° 101060707)

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n°101060707)

7.34.2 Measures

Measures: *Fishery - Sustainable Approachs/Practices - Target species restrictions Fishery - Temporal Approaches/Practices - Closed areas and closed seasons Aquaculture - Natura 2000 Area Considerations - Assessment of plans and projects*

7.35 Q 18 - How to identify priority areas for preserving/restoring reef-forming species such as oysters Lanice conchilega or mussels?

Broader "Question"

- *Q 16 - How to prioritize areas for conservation (designation of new MPAs)?*

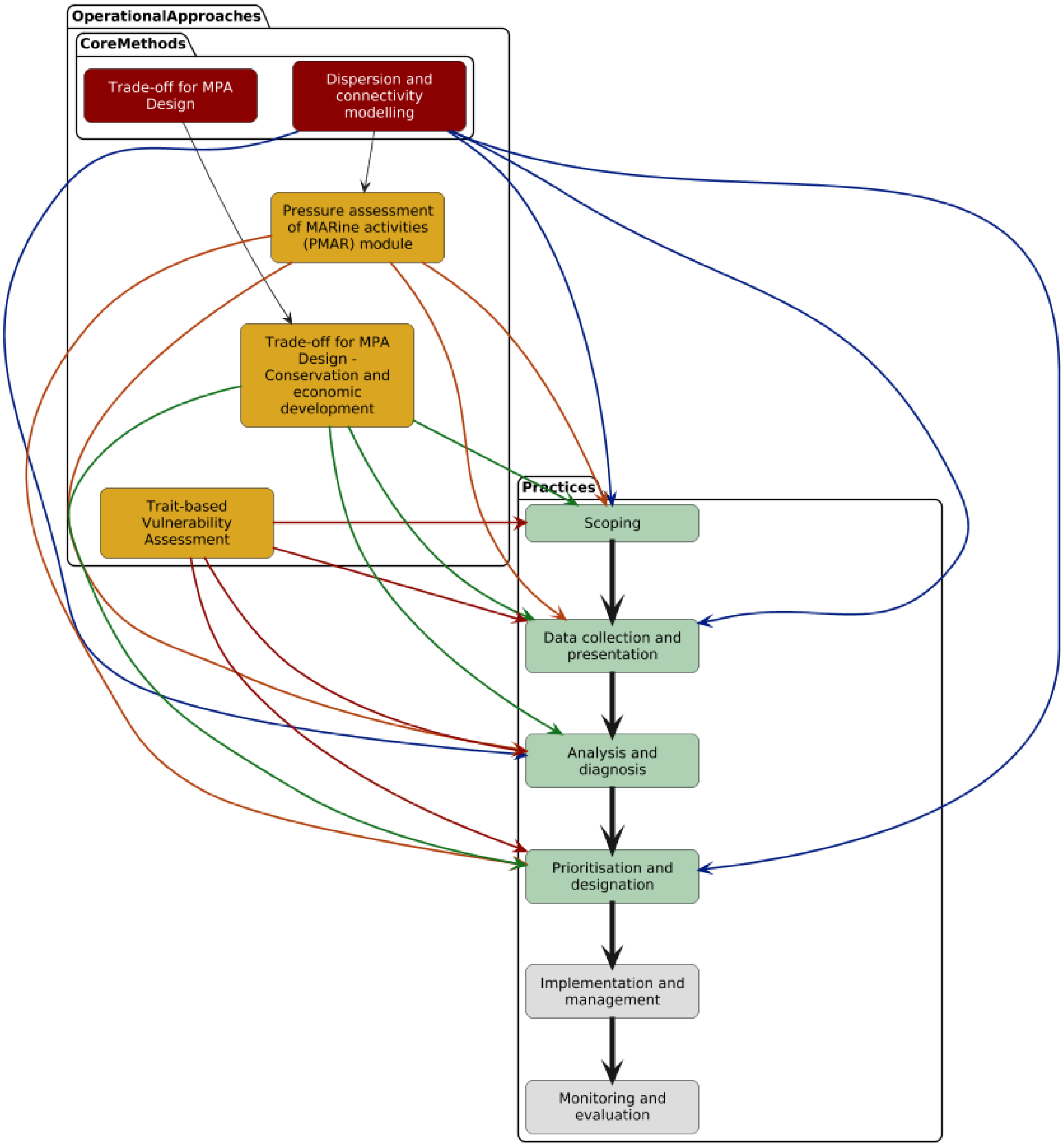
Narrower "Questions"

- *Q 6 - What are the priority areas for preserving from climate change effects the reef-former Lanice conchilega?*

Related sites

- *Belgian part of the North Sea*

7.35.1 Answers



Operational approaches

- *Dispersion and connectivity modelling* (Dispersion and connectivity modelling)
- *Pressure assessment of MARine activities (PMAR) module* (Dispersion and connectivity modelling)
- *Trade-off for MPA Design - Conservation and economic development* (Trade-off for MPA Design)
- *Trait-based Vulnerability Assessment* (Trait-based Vulnerability Assessment)

ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone

Criteria classes: *1.1.1 Vulnerability 1.1.2 Stability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas 1.2 Structural 1.4 Ecological status*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
      - Criteria *Sensitivity*
    - Macro-criterion *Stability*
      - Criteria *Ecosystem Integrity*
    - Macro-criterion *Life cycle critical areas*
      - Criteria *Recruitment areas*
    - Macro-criterion *Functional hotspots*
  - Subcategory *Structural*
  - Subcategory *Ecological status*

Operational approaches: *(Method) Dispersion and connectivity modelling (Tool) Pressure assessment of MARine activities (PMAR) module (Method) Trade-off for MPA Design - Conservation and economic development (Method) Trait-based Vulnerability Assessment*

Implementation details

To answer this question, we highly recommend to follow the guidance flow (CAMBRA et al., 2024) which is designed to answer to this type of management question. The core analysis is a sensitivity-based vulnerability assessment and the definition of a portfolio of scenarios. To support the process, for benthic species, a census list of traits of importance, with an already filled matrix for British Isles and the main species of interest including Lanice conchilega and different mussel species, can be found in the Biological Traits Information Catalogue (BIOTIC) (Marine Life Information Network. Plymouth: Marine Biological Association of the United Kingdom, 2006).

Prioritizing areas depends mostly on indicators of stability, connectivity, presence and abundance (hotspots). It is important to identify productive areas and healthy ecosystems (assess the good status).

The question relates to several criteria from ESE1. Sensitivity for example is very important in this case, with the goal of identifying priority areas for preservation/restoration of reef-forming species, as it is the degree to which a species is influenced by one or more aspects of climate (Dawson et al., 2011) or anthropogenic stressors, with sensitivity directly related to the species' inner traits and is used in Vulnerability assessments. Other criteria in the Vulnerability and Stability macro-criteria of the ESE1 can be relevant for the answering of this question such as: Traits-based Adaptivity, Resilience/Recovery, Resistance, Species Vulnerability to Climatic and Anthropogenic stressors, Ecosystem Integrity, General Adaptivity and Stability.

Critical life cycle areas macro-criteria includes connectivity related criteria such as larval source and recruitment areas (larval sink areas), which is an important element to be taken into account when seeking to preserve/restore mussels. Abundance hotspots of a functionally important species such as Lanice conchilega strongly relates to the defined criteria of Presence of key functional species and key functional areas (e.g. larval source areas).

The second criteria type, not directly depending on the ecological part, is the feasibility of the protection depending on the intensity and importance of human activities and the possibility to agree to a trade-off decision and ensure monitoring and compliance (cf. ESE3).

For restoration purpose, several guidelines exist that synthetize the best known practices at least for mussels. Performing a review of this guidance to select the most relevant methods regarding local conditions and the development of a dedicated monitoring in the chosen area is highly recommended.

MSPdF Classification: *Marine & Coastal Environment -> Ecosystem: Species Marine & Coastal Environment -> Ecosystem: Habitat Ecosystem Services: Regulation & Maintenance (Biotic) - 2.2.3.1 Pest control (including invasive species) Ecosystem Services: Regulation & Maintenance (Biotic) - 2.2.3.2 Disease control Legal, Governance & Planning: Fisheries Legal, Governance & Planning: Aquaculture Legal, Governance & Planning: Conservation (i.e. Protected areas) Legal, Governance & Planning: Strategic - Regional*

Notes

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n°101060707)

Practices: *[Not Related to Any Practice]*

7.35.2 Measures

Measures: *Fishery - Spatial Approaches/Practices - Mapping habitats Fishery - Spatial Approaches/Practices - Benthic protection areas bottom trawling Offshore renewable energy - Sector-environment - Nature enhancement Marine non-living resources - Annual Reports Using EMS Data - Environmental performance reports Marine non-living resources - Environmental aspects - Means for the returning of a species Marine non-living resources - Environmental aspects - Exclusion zones for sensitive features Aquaculture - General Planning Rules based on - Ecosystem Service Tools Offshore renewable energy - Planning and site selection OWF - Alternative installation methods*

7.36 Q 6 - What are the priority areas for preserving from climate change effects the reef-former Lanice conchilega?

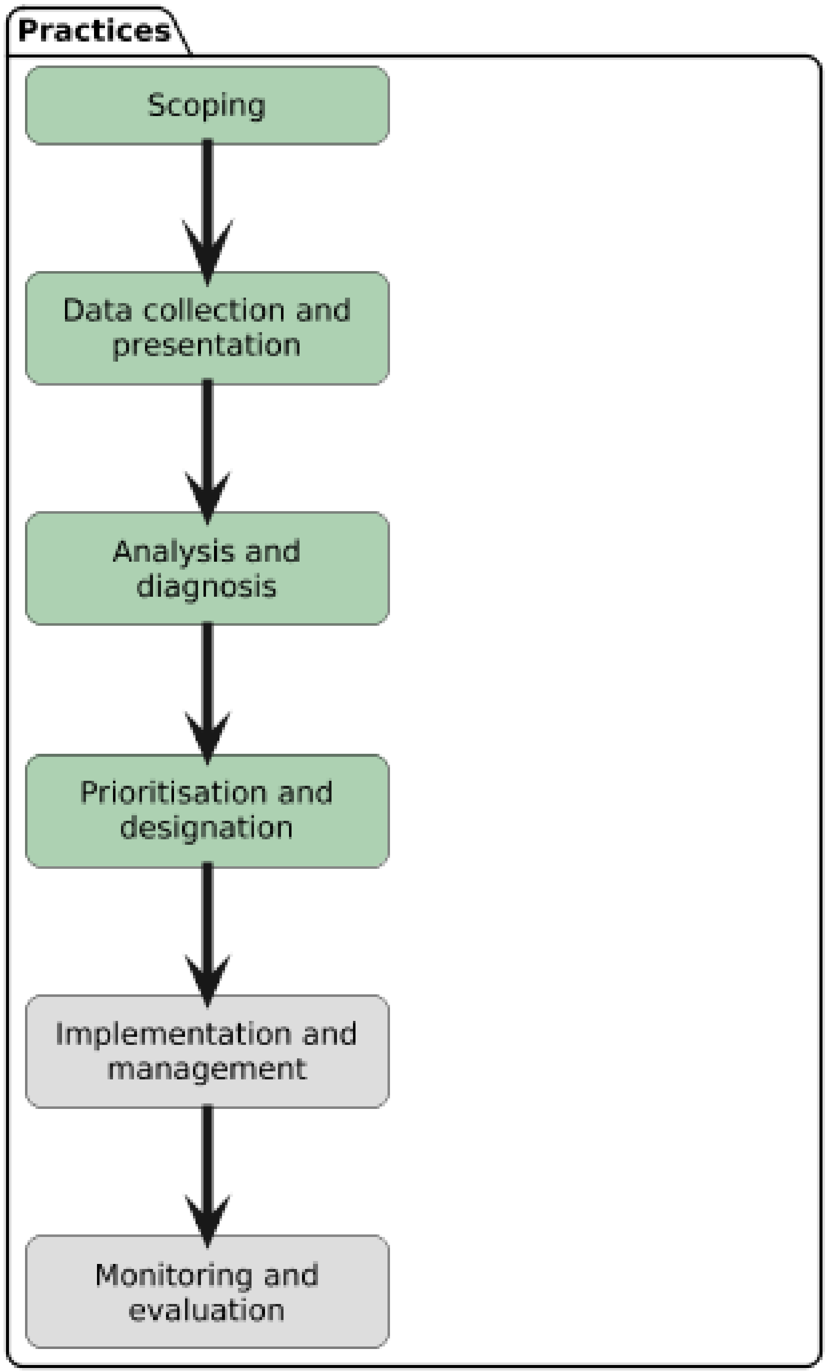
Broader “Question”

- *Q 18 - How to identify priority areas for preserving/restoring reef-forming species such as oysters Lanice conchilega or mussels?*

Related sites

- *Belgian part of the North Sea*

7.36.1 Answers



ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea

Criteria classes: *1.1.1 Vulnerability 1.1.5 Climate-smart potential*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
      - Criteria *Species Vulnerability to Climatic and Anthropogenic stressors*
    - Macro-criterion *Climate-smart potential*
      - Criteria *Climate-smart potential*

Implementation details

To answer that question, we highly recommend to follow the guidance flow (CAMBRA et al., 2024) which is designed to answer to this type of management question. The core analysis is a sensitivity-based vulnerability assessment and the definition of a portfolio of scenarios. To support the process, for benthic species, a census list of traits of importance, with already filled matrix for British Isles and the main species of interest including Lanice conchilega, can be found on the Biological Traits Information Catalogue (BIOTIC) (Marine Life Information Network. Plymouth: Marine Biological Association of the United Kingdom, 2006).

Prioritising areas depends mostly on indicators of stability, connectivity, presence and abundance (hotspots). It is important to identify productive areas and healthy ecosystems (assess the good status). The second criteria type, not directly depending on ecological part, is the feasability of the protection depending on the intensity and importance of human activities and the possibility to find trade-of and ensure monitoring and compliance (cf. ESE3).

Notes

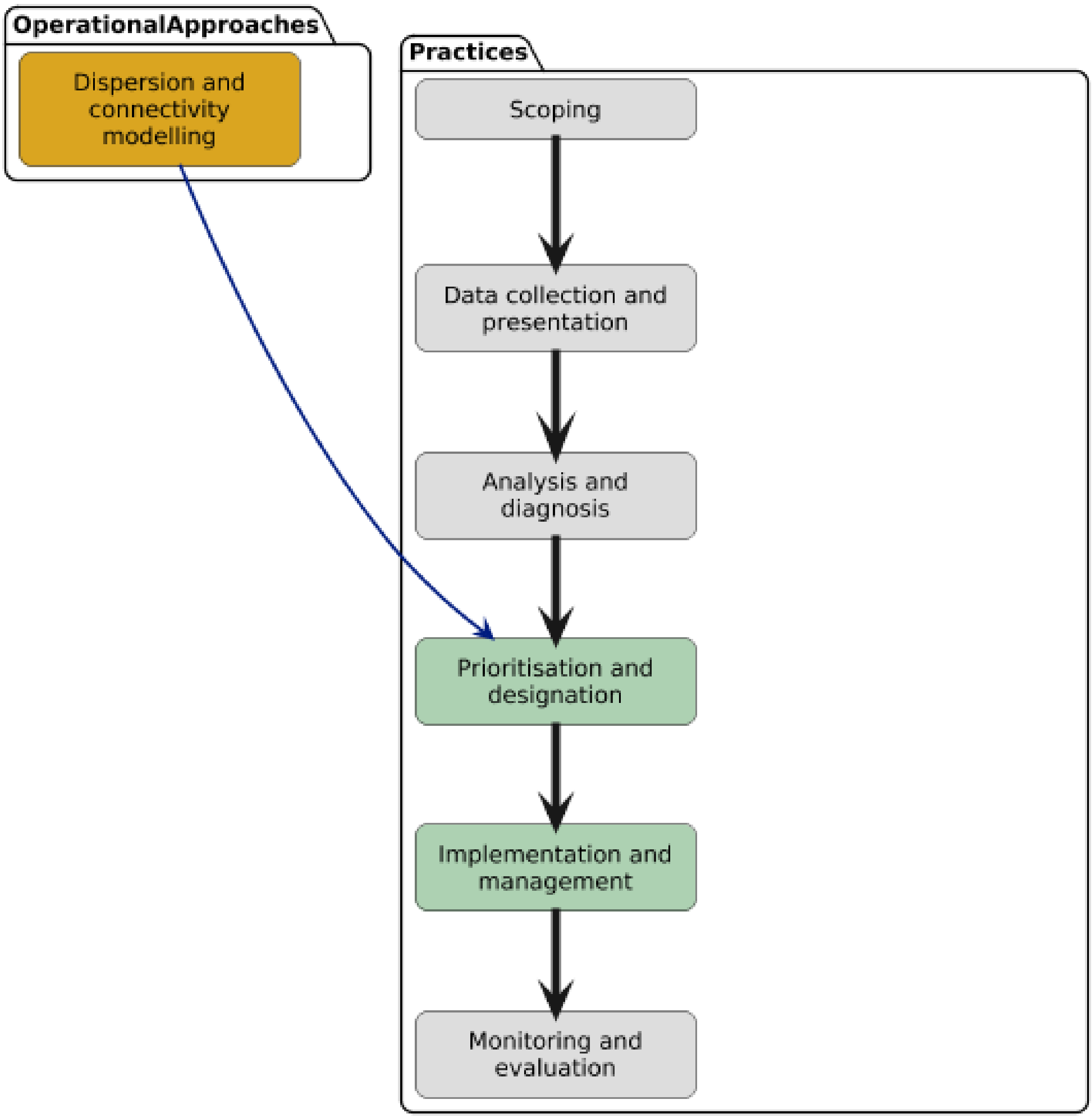
Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n°101060707)

7.37 Q 37 - How to maintain local retention / population persistence within the MPA?

Broader "Question"

- *Q 16 - How to prioritize areas for conservation (designation of new MPAs)?*

7.37.1 Answers



Operational approaches

- *Dispersion and connectivity modelling* (Dispersion and connectivity modelling)

ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea

Criteria classes: *1.1 Functional 1.1.1 Vulnerability 1.1.2 Stability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas 1.1.5 Climate-smart potential 1.2 Structural 1.3 Genetic 1.4 Ecological status*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Stability*
    - Macro-criterion *Functional hotspots*
    - Macro-criterion *Life cycle critical areas*
    - Macro-criterion *Climate-smart potential*
  - Subcategory *Structural*
  - Subcategory *Genetic*
  - Subcategory *Ecological status*

Operational approaches: *(Method) Dispersion and connectivity modelling*

Implementation details

To answer this question, the planning team need to prioritise a list of species of interest in maintaining population persistence to maximise the benefits while minimizing the effort made. The selection could be made by analysing synergies between conservation targets. Species chosen could be charismatic species such as umbrella species offering a potential to provide positive conservation efforts to other species (e.g. cetaceans). It is recommended to choose species that hold a functional importance to the ecosystem in the MPA, such as Apex predators, primary producers, habitat forming species etc (see macro-criterion Functional hotspots) or highly threatened species listed in the conventions appendices if the management priority is aimed at conservation.

Traits affecting the potential of the population to adapt to detrimental conditions need to be identified. For example the capacity, extent, ease and frequency to which individuals of a species can move between areas (connectivity, whether passive, i.e. driven by ocean currents or active connectivity through movements of varying scales such as long distance migrations or smaller vertical movements in the water column). To maintain population persistence of a species, a traits-based vulnerability assessment should be conducted which provides a level of vulnerability of a species to the variety of relevant impacts that the species is subjected to.

Local retention/population persistence depends on favorable conditions for a species to remain in an area, grow, reproduce and survive. It also depends on connectivity - an aspect integrated in several of the ESE1 ecological macro-criteria. For example for the macro-criterion Stability, the maintenance of stability, persistence and adaptation depends on connectivity. Species can undertake passive (larval movements pushed by ocean currents) or/and active movement/connectivity (e.g. migrations by cetaceans to foraging, breeding and developmental grounds). Macro-criterion Life cycle critical areas describes in more detail the different types of areas that can aid in the persistence of a population in an MPA, for example if the MPA contains favorable conditions such as functionally important and key life cycle areas used by species as spawning areas, this will allow a species to reproduce, potentially settle in the area or return in the future. The designation, enlargement or spacing of an MPA with regards to other MPAs/protected areas should take into account the presence and location of these key species, habitats and areas so that they can be effectively conserved.

Life cycle critical areas such as criteria larval source, larval sink/settlement areas provide connectivity for populations and species and should be identified, monitored and conserved due to their importance for population persistence. This can be aided by tools such as biophysical models that can provide information on how marine larval dispersal occurs in an area or for larger animals such as elasmobranchs, telemetry can be utilized such as acoustic and satellite tags, that can provide data on movements and habitat use.

Ecological Status is another important factor for population persistence, i.e. the state or condition of the ecological features being considered, for example whether species are endangered or whether environments are degraded or not. These types of criteria are currently used in environmental legislation and habitat/species/criteria lists to prioritize the protection of already threatened areas/ecological features that require a removal of pressures. Even though some of these criteria refer to the condition of biotic processes or interactions, the majority refer to population sizes of threatened species present in the area of interest; therefore the conservation status is currently defined rather with structural aspects than with process-based functional properties (Deliverable 2.2).

Ecological status relates to the criteria ecosystem integrity under macro-criterion Stability, as well as macro-criterion Vulnerability. Steps taken to maintain ecosystem integrity aids in population persistence as stability, in this case for the population of a species depends on favorable conditions allowing the level at which the population is affected by anthropogenic impacts (fishing, habitat destruction, climate change etc) and natural variation (natural mortality rates) is sufficiently replenished through reproduction of the species in question. All impacts of activities that are currently affecting or can affect the species of study (in the present and in future scenarios) should be identified, quantified and eliminated or mitigated if possible.

Notes

This question is related to Question 55: How to adress CC within a MPA network? We highly recommend to consult this answer for more details about connectivity and network building under changing conditions. Please refer in addition to an extensive description that is highly relevant to this question contained in Section 3.2.4 of D3.2 "Portfolio of improved ecological criteria to be applied in systemic biodiversity protection and restoration".

7.38 Q 36 - How to maintain mobile species persistence (and connectivity) and population/community persistence (passive connectivity) across a transboundary MPA?

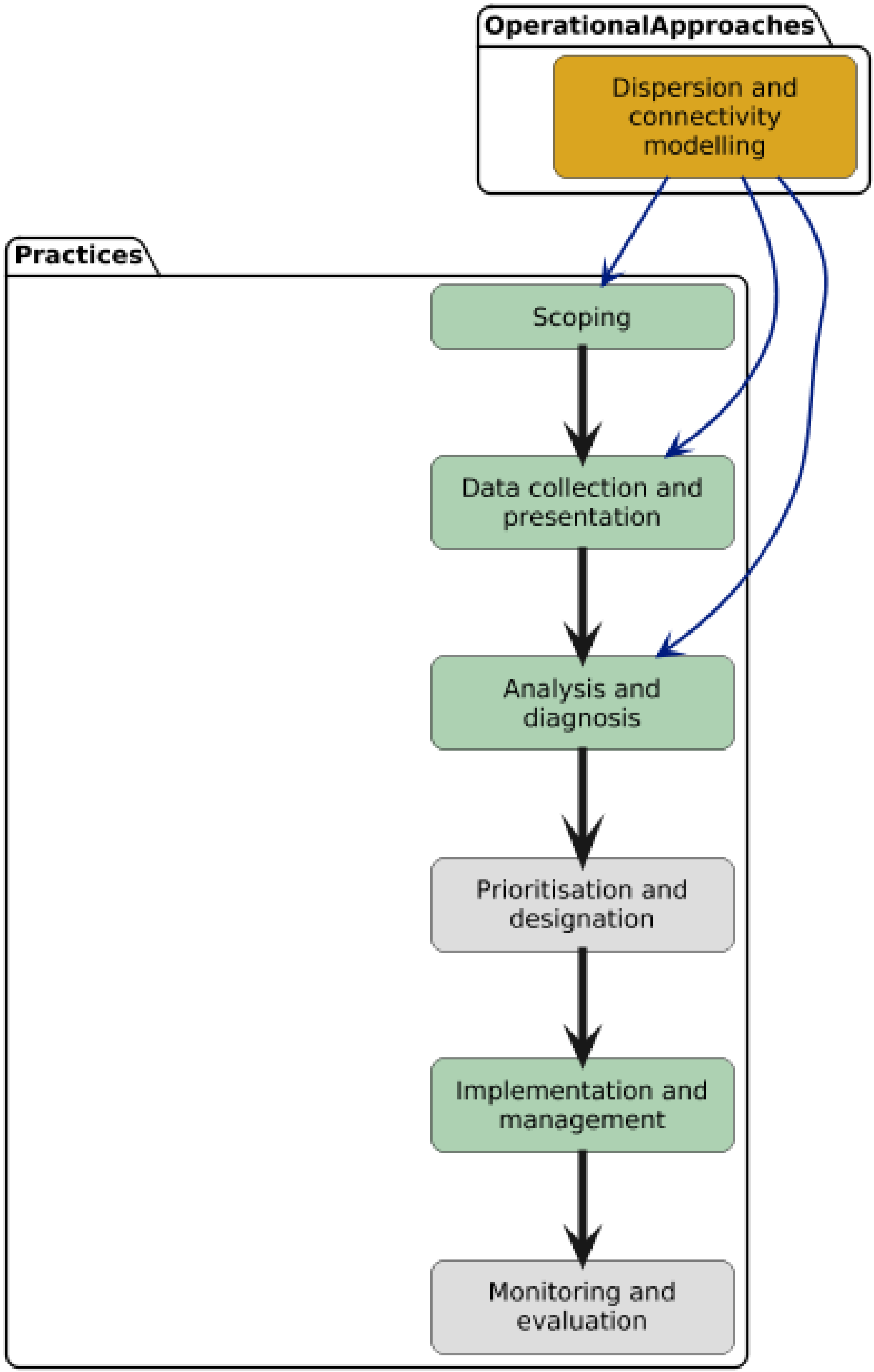
Broader "Question"

- *Q 16 - How to prioritize areas for conservation (designation of new MPAs)?*

Related sites

- *North-Western Mediterranean (NW-MED)*

7.38.1 Answers



Operational approaches

- *Dispersion and connectivity modelling* (Dispersion and connectivity modelling)

ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis*
Spatial scales: Transboundary / sea basin
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea

Criteria classes: *1 Ecological and genetic criteria 1.1 Functional 1.1.1 Vulnerability 1.1.2 Stability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas 1.1.5 Climate-smart potential 1.2 Structural 1.3 Genetic 1.4 Ecological status*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Stability*
    - Macro-criterion *Functional hotspots*
    - Macro-criterion *Life cycle critical areas*
    - Macro-criterion *Climate-smart potential*
  - Subcategory *Structural*
  - Subcategory *Genetic*
  - Subcategory *Ecological status*

Operational approaches: *(Method) Dispersion and connectivity modelling*

Implementation details

Please refer to the answer to Question 37 which includes a much more extensive description regarding the maintenance of population persistence, the importance of connectivity, the identification of impacts that can affect the vulnerability of a population and the criteria and tools that can be used.

Please also consult Deliverable 3.1 “Critical review on multilevel ecological processes to improve systemic biodiversity protection and restoration strategies in Europe” (Bongiorni et al. 2023) Chapter 4 “Connectivity” includes a detailed description of how to approach this aspect including the different types of connectivity, approaches, metrics and tools.

The key difference between the questions is that a transboundary MPA will present additional hurdles for the maintenance of a species’ population persistence. Collaboration and communication between the different countries, different actors and stakeholders is of the utmost importance in order to streamline initiatives that seek to conserve species, allowing the favorable conditions required for local retention, population persistence and connectivity between life cycle areas such as steppingstone areas and recruitment areas.

Notes

This question is related to Question 55: How to adress CC within a MPA network? We highly recommend to consult this answer for more details about connectivity and network building under changing conditions. Please refer in addition to an extensive description that is highly relevant to this question contained in Section

3.2.4 of D3.2 “Portfolio of improved ecological criteria to be applied in systemic biodiversity protection and restoration”.

7.39 Q 58 - How to protect vulnerable species against climatic stressors?

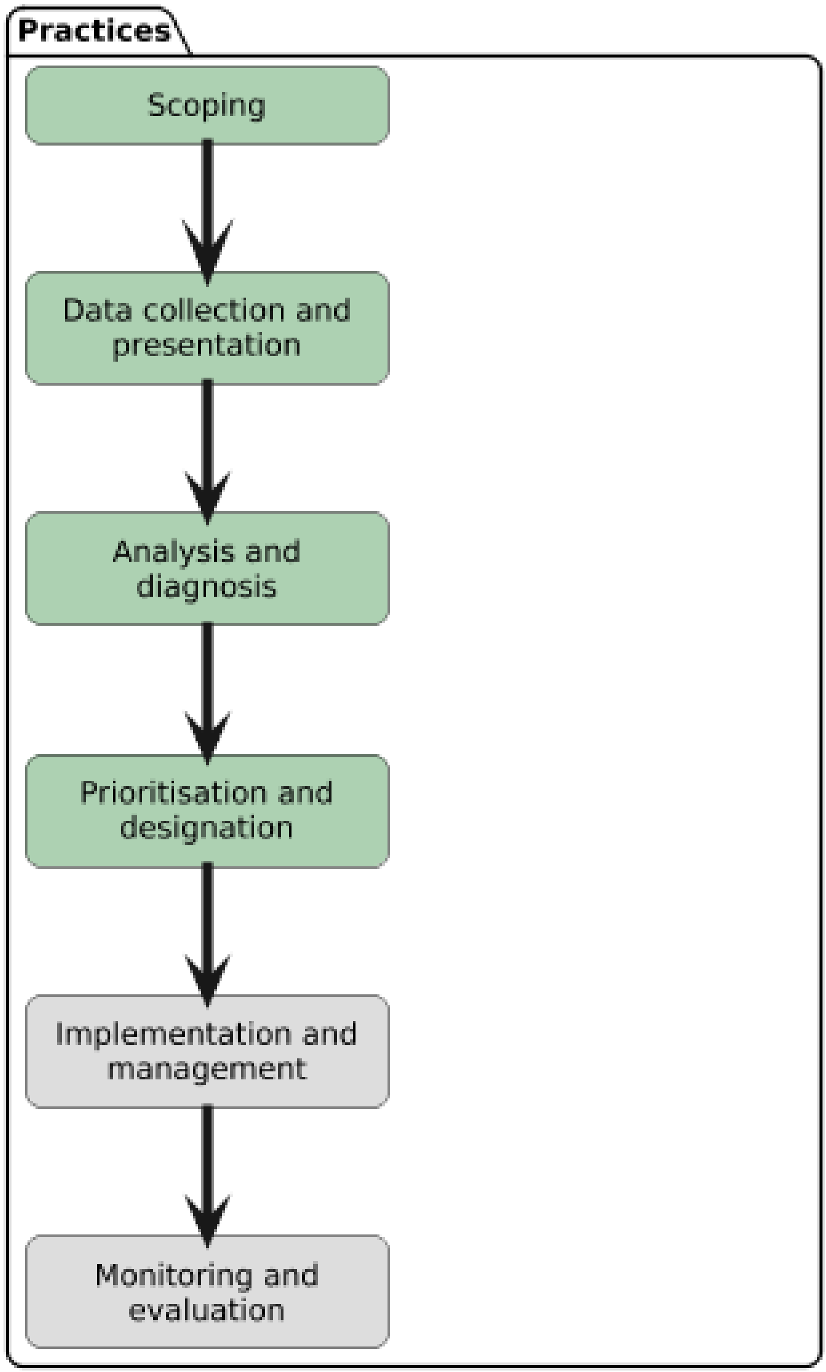
Broader “Question”

- *Q 16 - How to prioritize areas for conservation (designation of new MPAs)?*

Related sites

- *Western Black Sea*

7.39.1 Answers



ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Criteria classes: *1.1.1 Vulnerability*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*

Implementation details

The first step of answering the question is to define the reason why a species is called vulnerable. The identification of the main pressures and the analysis of species inner traits (Risk assessment, using Sensitivity criteria) could help you to define if the vulnerability is linked to anthropogenic, climatic stressor or both and so support you in the process of identifying potential management levers (CAMBRA et al., 2024 - 5.2 - ESE criteria Species Vulnerability to Climatic and Anthropogenic stressors). Performing the analysis at different time scales (short-, mid- and long-term) will support you in the process of defining a sequence of actions related to the expected intensity and Time of Emergence of the different stressors. For VMEs (Vulnerable Marine Ecosystems) it is presumed by the scientific community that discarding the first anthropogenic stressor (e.g., fisheries) can be sufficient to make them resist to climate change incidence.

In general, more than protected vulnerable species against climatic stressor, the human direct pressure will be decreased by the implementation of restrictions (e.g., Fishing restricted areas, marine reserves…) to avoid the multiplication of additive stressors and enhance the possibility of species resistance. Some restauration measures can also be promoted in this areas but their efficiency is site and species-dependants.

The key words of the protection of sensitive species is monitoring, anticipating and planning. We highly recommand to follow the step by step guidance developed inside the MSP4BIO project to support the answer of this type of question, especially the list of strategies and criteria defined in the chapters 5 and 6 (CAMBRA et al., 2024).

Notes

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n°101060707)

7.40 Q 33 - What are the environmental legislation/criteria guidance for MPA designation including socio-economic criteria (Commission's SWD, EU Directives, IUCN, new criteria UNCLOS?)

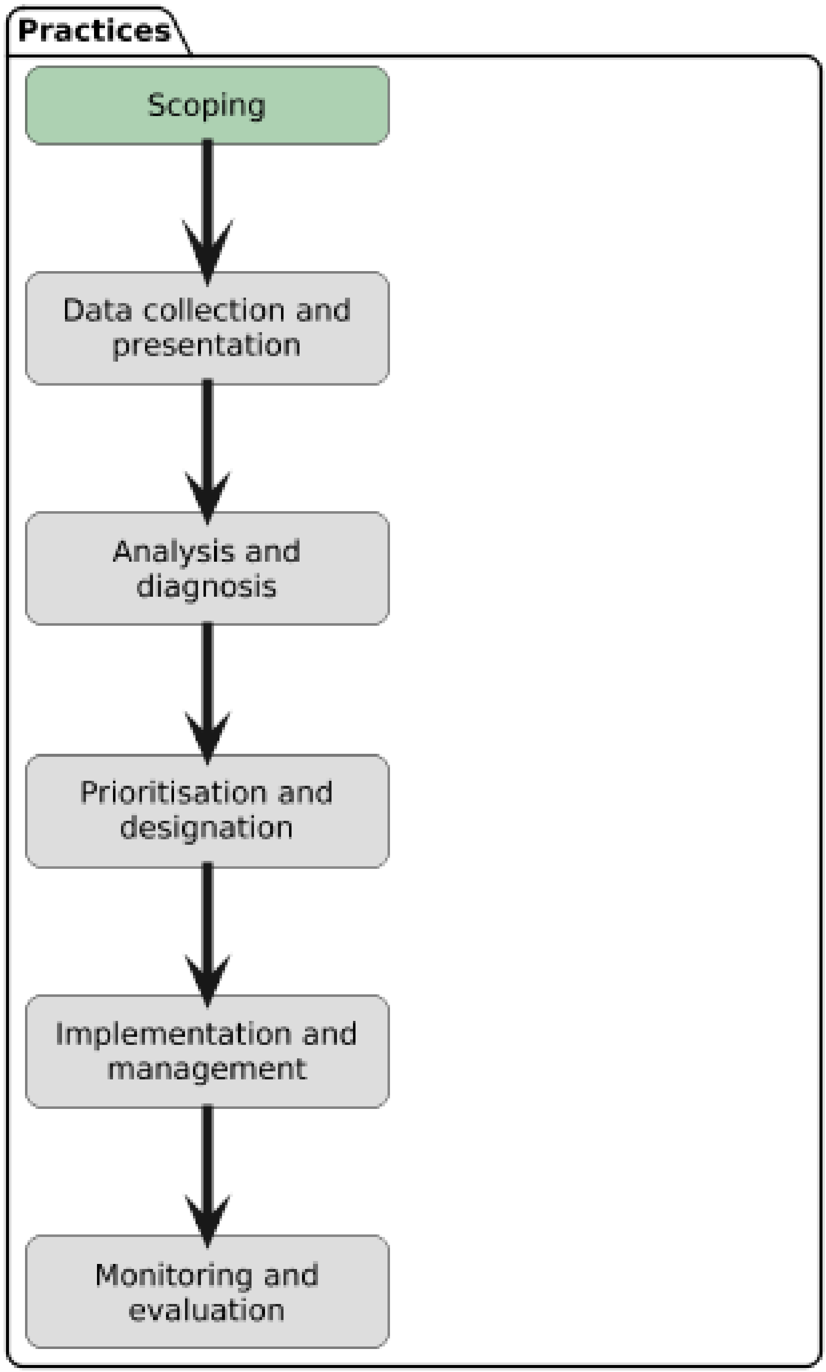
Broader "Question"

- *Q 16 - How to prioritize areas for conservation (designation of new MPAs)?*

Related sites

- *Western Black Sea*

7.40.1 Answers



ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone Deep sea Offshore zone

Implementation details

A synthesis of up-to-date criteria to define climate-smart MPA was performed in the MSP4BIO guidance. This list of criteria should be regularly revised but represent a good basis on a ecological point of view.

Deliverable 2.2 categorizes 4 Types of Criteria Lists based on their purpose and the ones deemed relevant to the question are listed below.

Type 3 is particularly relevant to this question. This information may provide guidance to answering this question on environmental legislation/criteria guidance for the designation of an MPA, however with regards to socioeconomic criteria this is more appropriately answered by the other ESE modules.

Type 1: Lists used for the identification of significant areas for conservation e.g. Important Bird and Biodiversity Area, Cetacean Critical Habitat and Ecologically or Biologically Significant Marine Areas (EBSAs)), which can inform decision making for the identification of areas to be protected.

Type 2: Lists used for the identification of significant ecological features for conservation, including lists of species and habitats for conservation purposes. For example, the IUCN developed criteria to decide which species or other ecological features should be on their red list. These lists, such as the IUCN red list and the conservation status categories they defined with criteria lists, inform the identification of significant areas or the designation of ABMTs.

Type 3: Lists used for the designation of suitable areas for implementing area-based management tools (ABMTs). These lists are used to delineate an area for which conservation measures will be implemented through officially recognized MPAs, as well as OECMs. For example, criteria used to inform the designation of Natura 2000 sites, or criteria for suitable areas for designating Particularly Sensitive Sea Areas, an OECM managed by the International Maritime Organisation (IMO).

For further information on the criteria lists used for the designation of suitable areas for implementing area-based management tools (ABMTs), you will find examples at Global, European and Regional level on page 27 of D2.2.

Notes

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n°101060707) chapter 6.1.1

7.41 Q 7 - How to protect deep Vulnerable marine Ecosystems (VMEs) (strategies, measures, etc.)?

Narrower "Questions"

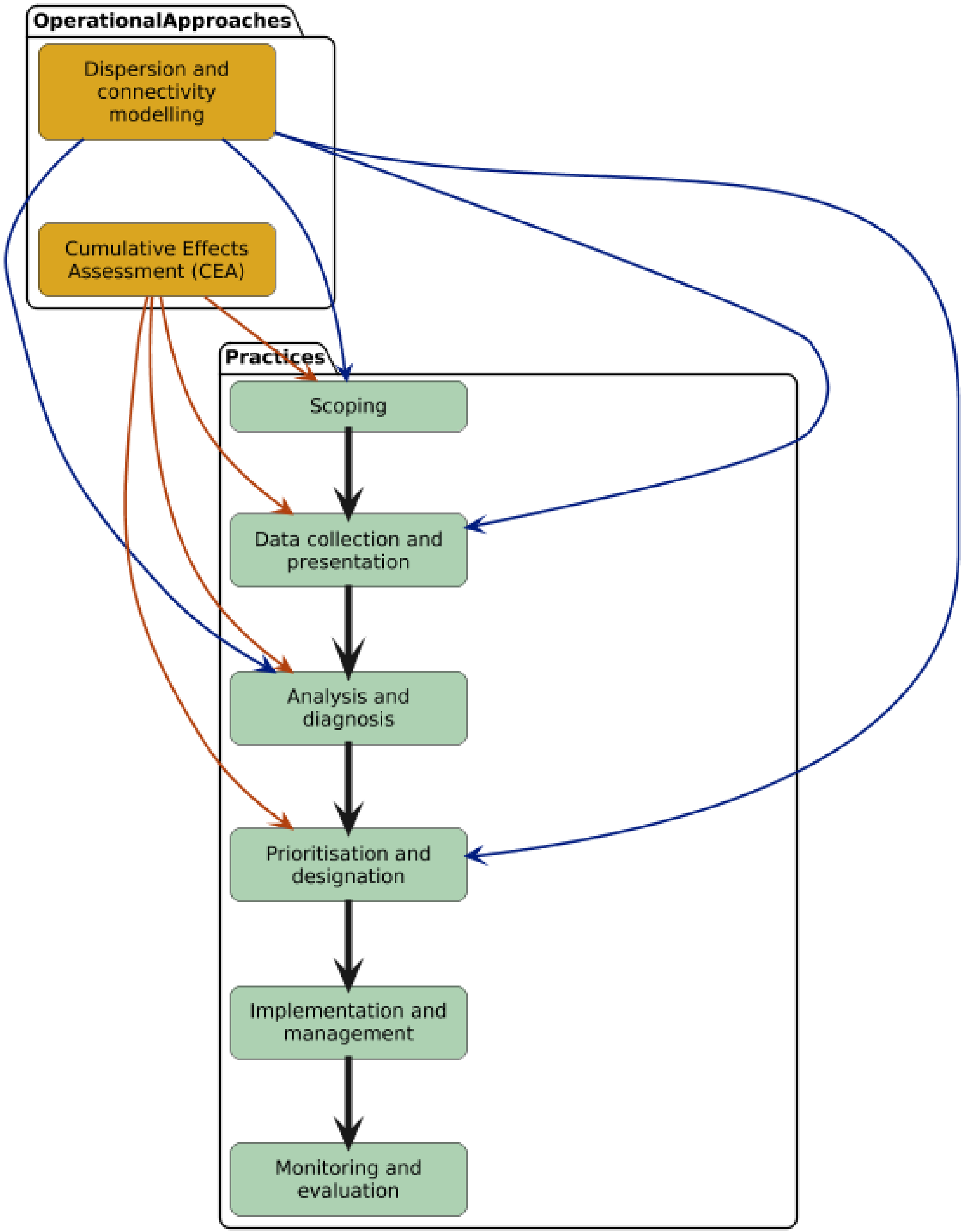
- *Q 50 - How can deep-water VMEs be effectively identified and conserved with regards to anthropogenic impacts arising from human activities?*

Related sites

- *North-Western Mediterranean (NW-MED)*

Notes   Key words: VME, indicator for vulnerable species, protection, survival, maintenance, functionality, trajectories, priorities, future, climate change, sensitivity to human impacts, connectivity

7.41.1 Answers



Operational approaches

- *Dispersion and connectivity modelling* (Dispersion and connectivity modelling)
- *Cumulative Effects Assessment (CEA)* (Cumulative Effects Assessment (CEA))

ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea

Criteria classes: *1.1.1 Vulnerability 1.1.4. Life cycle critical areas*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Life cycle critical areas*

Operational approaches: *(Method) Dispersion and connectivity modelling (Method) Cumulative Effects Assessment (CEA)*

Implementation details

Note. In this question, we consider highly tied direct anthropogenic and climatic stressors to provide the most complete answer to the question. First of all, to reduce direct pressure on VME from an ecological point of view, we encourage the proposed measure of moving the limits of authorized bottom-trawling from 1000m to 800m as measure of protection of deep-sea habitats and VME species.

1. Defining VME

The promoted ecological approach in that case focus on area-based measures using VME species as indicators of priority conservation target (biological target). There is no regional official list of species considered as VME indicators but the FAO and Oceana present a full worldwide list of species on their website and a list of criteria used to define a VME. You need to identify the relevant institutions for each area responsible of VME management and contact them to make a state of actual knowledge and built your own species list. For example, in the Mediterranean Sea, the GFCM is responsible for the co-management of VME and bottom trawling. You can also find some working documents highlighting 76 species in the whole Med plus 2 families (Aphanipathidae and sabellidae) and 9 genus considering as VME. This question focus particularly on deep-sea species (particularly seamounts) and cold water corals.

The criteria to define VME according to the FAO are the following: - Uniqueness and rarity: area or ecosystem containing unique or rare species whose loss could not be compensate by similar area or ecosystem - Functional significance of the habitat: discrete areas or habitats that are necessary for survival, function, spawning/reproduction or recovery of fish stocks, particular life-history stages or of rare, threatened or endangered marine species - Fragility: An ecosystem that is highly susceptible to degradation by anthropogenic activities. - Life-history traits of component species that make recovery difficult: ecosystems that are characterized by populations or assemblages of species with one or more of the following characteristics: slow growth rates, late age of maturity, low of unpredictable recruitment, long lived, etc. - Structural complexity: an ecosystem that is characterized by complex physical structures created by significant concentrations of biotic and abiotic features. In these ecosystems, ecological processes are usually highly dependent on these structured systems. Further, such ecosystems often have high diversity, which is dependent on the structuring organisms.

A more complete description of these criteria could be found on the FAO website (https://www.fao.org/in-action/vulnerable-marine-ecosystems/criteria/en/).

The above criteria by the FAO defining VME's are related to the macro-criteria from ESE1: Vulnerability (all inner criteria), Stability (Ecosystem Integrity), Functional hotspots (Presence of key functional species) , Life cycle critical areas (larval sources and spawning aggregation areas, recruitment areas).

2. Identification of relevant pressures in the area of interest

In general for VMEs' the main direct pressure are fisheries, especially bottom-trawling and longlines, mining and, on the coastal areas, anchorage and tourism. As indirect stressors, climate change need to be incorporated at each level of reasoning but the complexity of stressors and stressors interactions need to be reevaluated regarding the time-scale of concern. Managers and decision-makers must be assist by a specialist in climatic projection.

3. Identify the level of protection or each areas of interest (based on MPA status, IUCN…)

4. Defining scientific and management strategies (general incomes) and potential management levers: 1. identify areas of VME's concentration (hotspot) thanks to up-to-date scientific knowledge (and potentially the development of models such as habitat suitability models, taking into consideration the potential high level of uncertainty of model outputs) and promote closure to fisheries, especially bottom trawling for benthic species. You can initiate by the protection of muddy areas as they concentrate bottom-trawling and are already heavily impacted. 2. Enlarge the decision-process to more rocky areas including other fishing practices and stressors. You can define priorities of conservation (both species and areas) using risk assessment. Include analysis of sensitivity of the different species to changing conditions (integrating known survival thresholds at mid-term conditions as it seems to be the temporal scale the most relevant for VME's risk assessment) (C.f. CAMBRA et al., 2024). Promote connectivity integration, to evaluate the potential benefits of protecting certain areas. 3. Develop appropriate protection and monitoring program in the chosen areas. At least, develop spatial closure with adequate time frame regarding species life-cycle and growth (e.g., closure must be permanent and non annual with an adequate duration of 10 years for corals) and eventually, promote restauration initiatives if relevant. Closure is considered as sufficient by the expert interviewed in the project framework but it depends on the site and the species. Apply the same reasoning for monitoring program, i.e. species development (one monitoring per year seems relevant). For monitoring program, it is necessary to develop better definitions of ecological good status, monitoring protocols, tools and metrics, commonly shared in the international community. 4. Develop knowledge on less known species (e.g. oyster reefs, white mussels, sponges…) 5. develop a methodology for data acquisition and completion, promote open source data

Notes

Sea D2.2 and FAO Website for more criteria defining what is a VME and for species lists.

7.41.2 Measures

ESE1 - Ecological toolkit

7.42 Q 50 - How can deep-water VMEs be effectively identified and conserved with regards to anthropogenic impacts arising from human activities?

Broader "Question"

- *Q 7 - How to protect deep Vulnerable marine Ecosystems (VMEs) (strategies, measures, etc.)?*

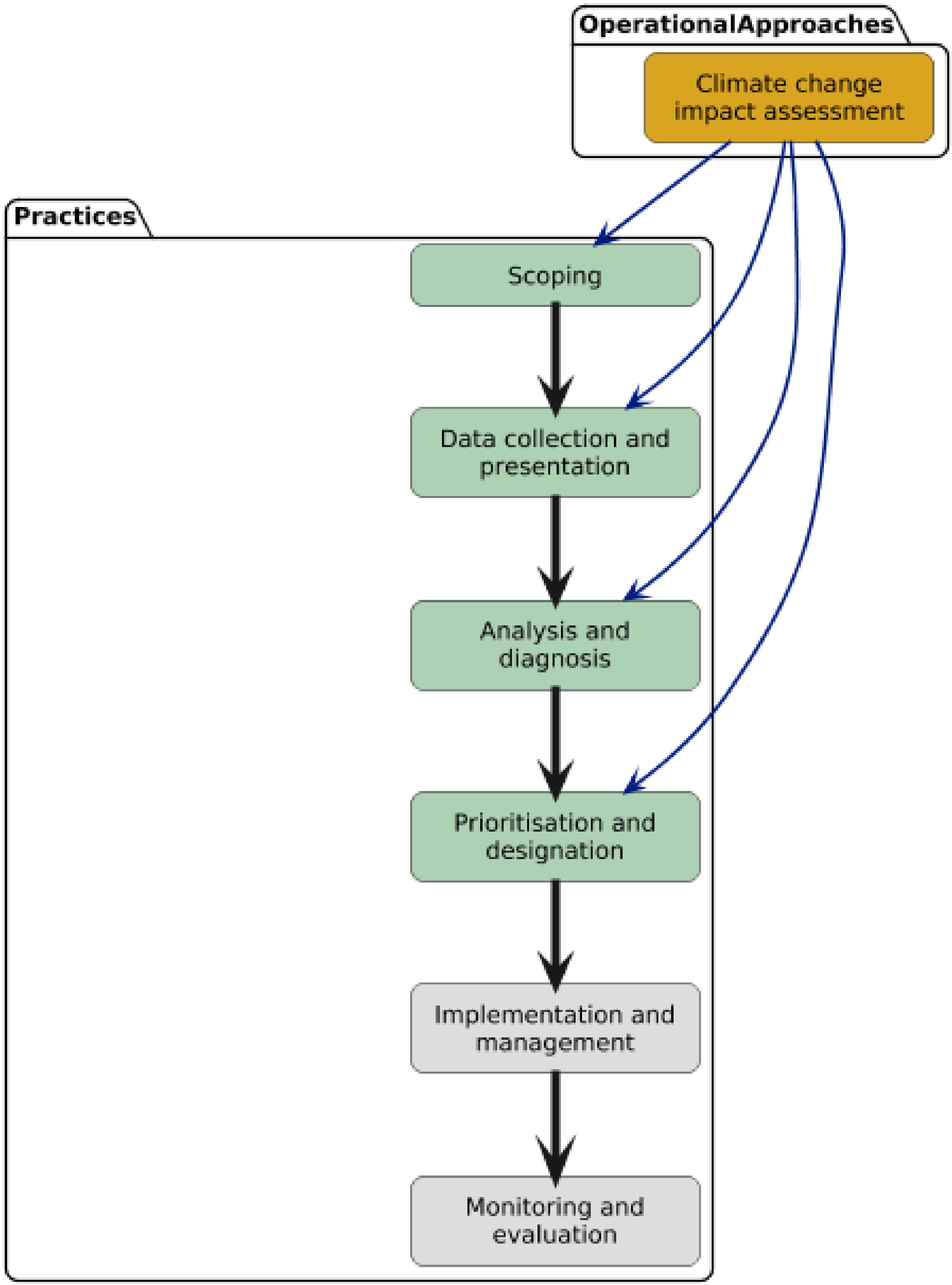
Narrower "Questions"

- *Q 51 - How can we minimize the impact of bottom trawling on the growth and survival of gorgonians and other cold water corals located in the NWMED deep-water VMEs?*

Related sites

- *North-Western Mediterranean (NW-MED)*

7.42.1 Answers



Operational approaches

- *Climate change impact assessment* (Climate change impact assessment)

ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Deep sea

Criteria classes: *1.1 Functional 1.1.1 Vulnerability 1.1.2 Stability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas 1.1.5 Climate-smart potential 1.3 Genetic 1.4 Ecological status*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Stability*
    - Macro-criterion *Functional hotspots*
    - Macro-criterion *Life cycle critical areas*
    - Macro-criterion *Climate-smart potential*
  - Subcategory *Genetic*
  - Subcategory *Ecological status*

Operational approaches: *(Method) Climate change impact assessment*

Implementation details

To effectively identify VME distribution, the development of an accurate and shared monitoring protocol is fully necessary such as the promotion of open databases. There is no regional official list of species considered as VME indicators but the FAO and Oceana present a full worldwide list of species on their website and a list of criteria used to define a VME. You need to identify the relevant institution for each area responsible of VME management and contact them to make a state of actual knowledge and build your own species list. When data are sufficient, hotspot identification and mapping is a key information to help define which areas are interesting to protect as, in general, closure of an area is the main management lever use to protect VME species. This closure can be achieved through the use of a national management lever in EEZ (e.g., MPA, fishery reserve) or Fishing Restricted Areas beyond the national waters.

The suppression of direct anthropogenic impacts, especially fishing pressure (bottom-trawling), is considered as sufficient by VME experts to promote VME conservation if the duration of the protection is in line with the targeted species biology (reproduction and growth). A period from 8 month for the more resilient species to 10 years of protection is recommended for these areas.

Criteria relating to the connectivity and completion of the life cycle for species in VMEs such as larval source and spawning aggregation areas, and recruitment areas (larval sinks) are highly applicable for the identification and conservation of VMEs as well as functional hotspots with VMEs containing the presence of key functional and habitat forming species such as coral reef species and criterion functionally representative areas - areas with many key functions. Macro-criterion Stability provides some criteria to be considered such as ecosystem integrity and adaptivity (the higher the level of functional diversity, the higher the probability of a system to adapt to new conditions), whilst Vulnerability's inner criterion sensitivity is also particularly important to consider due to their susceptibility of being affected by anthropogenic impacts. The vulnerability macro-criterion can be used in conservation for example to assess and predict the vulnerability of VME species and communities to anthropogenic impacts such as fishing and CC, to help define the boundaries of conservation, monitor if ABMTs are effective and identify the areas that are most vulnerable but also the areas that can aid in mitigation and adaptation under climate change (see macro-criterion climate-smart potential for more information).

Refer to question 51 for more information of fishing pressure evaluation and areas prioritization for VME conservation.

Notes

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n°101060707)

Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

7.43 Q 51 - How can we minimize the impact of bottom trawling on the growth and survival of gorgonians and other cold water corals located in the NWMED deep-water VMEs?

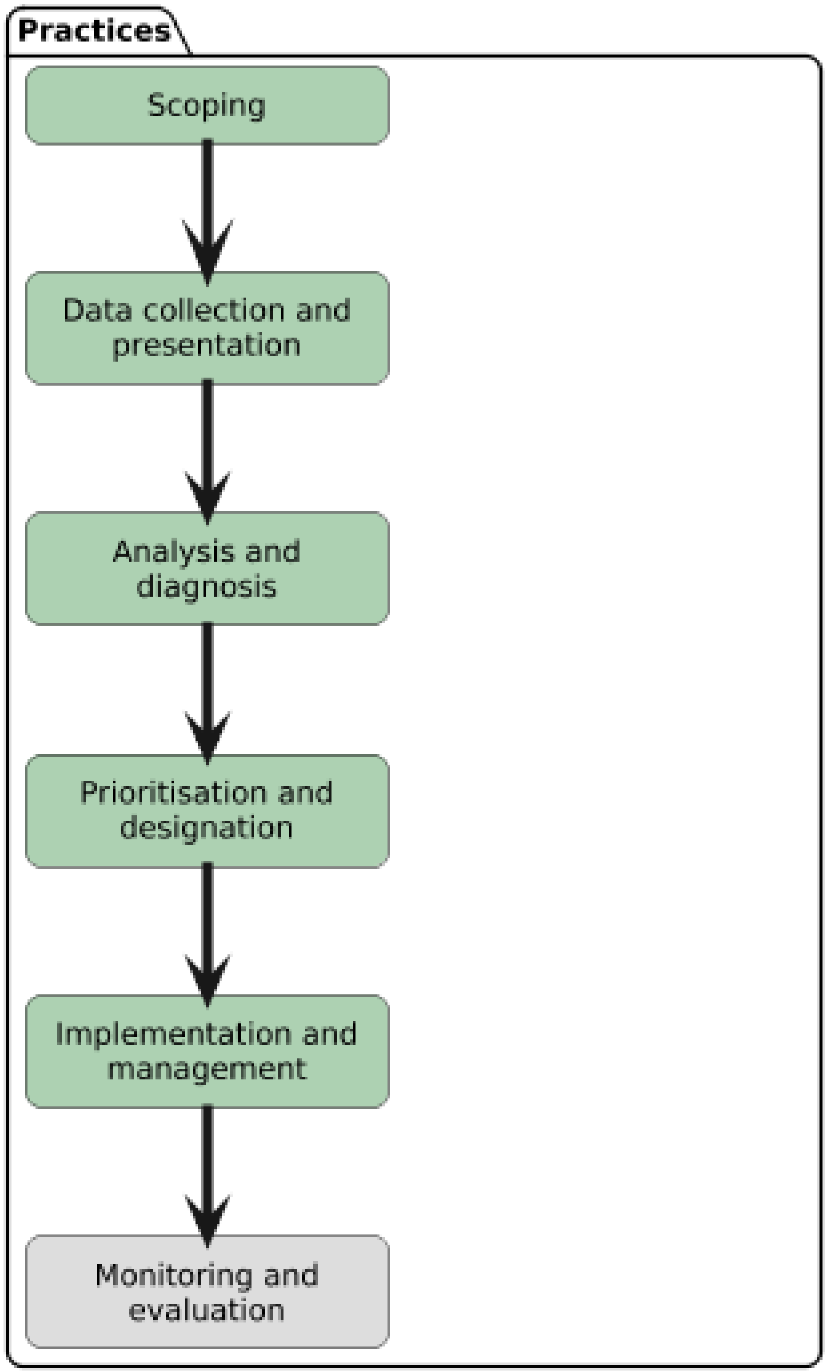
Broader "Question"

- *Q 50 - How can deep-water VMEs be effectively identified and conserved with regards to anthropogenic impacts arising from human activities?*

Related sites

- *North-Western Mediterranean (NW-MED)*

7.43.1 Answers



ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Non-strict protection

Marine zones: Coastal zone Deep sea

Criteria classes: *1 Ecological and genetic criteria 1.1 Functional 1.1.1 Vulnerability 1.1.2 Stability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas 1.1.5 Climate-smart potential*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Stability*
    - Macro-criterion *Functional hotspots*
    - Macro-criterion *Life cycle critical areas*
    - Macro-criterion *Climate-smart potential*

Implementation details

Note. As we consider bottom-trawling as the main pressure, we focus only on non-strict protection areas. We encourage the proposed measure of moving the limits of authorized bottom-trawling from 1000m to 800m as measure of protection of deep-sea habitats and VME species, from an ecological point of view.

Scoping phase considering only direct anthropogenic stressors:

The promoted ecological approach in that case focus on area-based measures using VME species as indicators of priority conservation target (biological target). There is no regional official list of species considered as VME indicator but the FAO and Oceana present a full worldwide list of species on their website and a list of criteria used to define a VME. You need to identify the relevant institution for each areas responsible of VME management and contact them to make a state of actual knowledge and built your own species list. For example, in the Mediterranean Sea, the GFCM is responsible for the co-management of VME and bottom trawling. You can also find some working documents highlighting 76 species in the whole Med plus 2 families (Aphanipathidae and sabellidae) and 9 genus considering as VME. This question focus particularly on deep-sea species (particularly seamounts) and cold water corals. Priorities: Deep-sea species even if most of the VME are located in coastal water

Measure generally promoted to answer to that question: Design new MPA, Design Network MPA/MSP, Manage Existing MPA (regulate or banned bottom trawling)

The main purpose of the question is to avoid direct pressure on the VMEs'species. The relevant criteria from the ESE1 (D3.1, D3.2, D3.3 and D3.4) are the following: Vulnerability (inner criteria: sensitivity), Critical life cycle areas (inner criteria: Connectivity-related aspects, Larval sources and spawning aggregation areas), Stability (inner criteria: ecosystem integrity).

The following methodologies are advocated to evaluate the incidence of bottom-trawling on identified cold-water corals: 1. Map the deep-sea corals presence, state of health and eventually known or potential connectivity pathways (based on up-to-date knowledge and eventually dispersal models considering genetic informations when availables). In this question Mining and Climatic sensitivity are not taken into account whereas they could be very important factors to assess potential success of management measures implemented here, consider the answers to the ESE questions 7 and 50 for further information. 1. Perform a spatial exposure assessment (CC methodological criteria in D3.3) using bottom trawling as main stressor. 2. Supperposed the obtained pressures maps to species distribution to highlight overlapping areas. Consider the health state of populations to identify most threaten areas. 3. Simulate different scenario of bottom-trawling redistribution testing different management levers and closures. 4.Redo step 2 5. Use a decision support tools to define a portfolio of scenarios associated with management levers (closure, gear restrictions…). Prioritise areas where the pressure will remain strong under the different scenarios and on highly productive areas (propagulas) or eventually threatened (following criteria Ecological Status). 6. Trade-off analysis to assess the acceptability of solutions (ESE 3).

General remarks: considered also longlines in the decision-process, especially on the head of canyons less accessible to bottom-trawlers.

7.44 Q 10 - How to protect marine mammals?

Narrower “Questions”

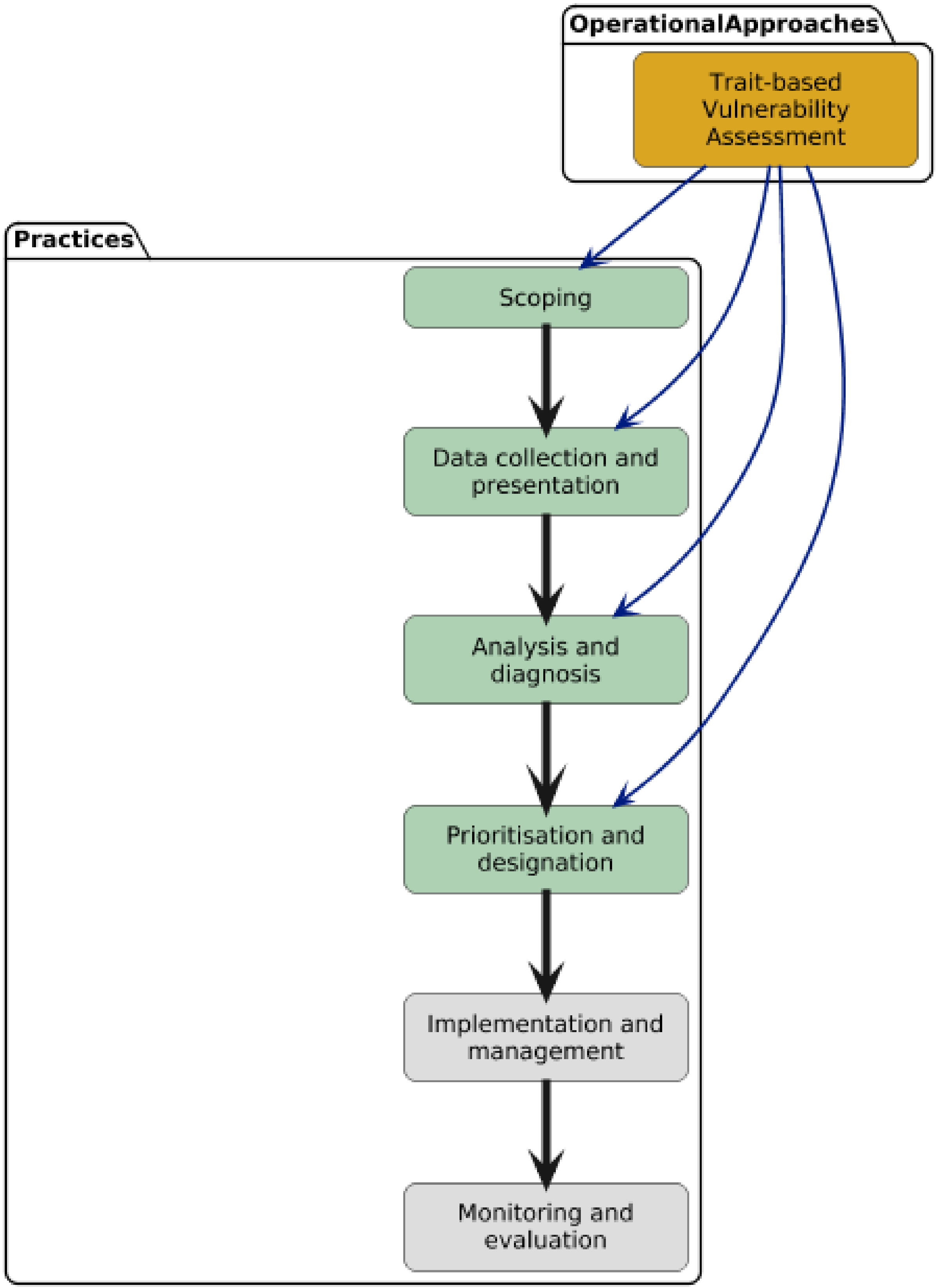
- *Q 49 - How to manage cross-border MPAs for cetaceans conservation?*
- *Q 48 - How to reduce risks (e.g. of collision) and impacts (e.g. from noise pollution) on key cetacean species, particularly during the breeding season and in sensitive areas?*

Related sites

- *North-Western Mediterranean (NW-MED)*

Notes The objective is to contribute to reach the Biodiversity targets 2030 in general.

7.44.1 Answers



Operational approaches

- *Trait-based Vulnerability Assessment* (Trait-based Vulnerability Assessment)

ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Offshore zone
Applications: *Marime Mammals & CC: NW Mediterranean prioritization for 2030*

Criteria classes: *1.1.1 Vulnerability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    * Macro-criterion *Vulnerability*
    * Macro-criterion *Functional hotspots*
    * Macro-criterion *Life cycle critical areas*

Operational approaches: *(Method) Trait-based Vulnerability Assessment*

Implementation details

For more information on this answer, please refer to question 52 - "How to protect pelagic habitats"?

Specific considerations on the scoping phase:

1. Spatio-temporal scale of the analysis: Projections need to be first "Near Term" and limited to the Med Sea (so the considered stressor is mainly Sea Surface Temperature regarding actual data availability and knowledge.)
2. Type of output application: the output should be a metric that could be ranked (score or quantitative) as the main purpose of the question is to compare and prioritize species. Trait-based vulnerability assessment is suitable as it will evaluate the influence of climate change on the species and provide a metric for comparison.
3. Expertise/Complexity of the model application: Marine mammals are moving species that will probably move before presenting the appearance of adaptations to climate change. Moreover, near-term questions are less likely to induce evolutionary process. For these reasons, a trait-based vulnerability assessment based only on Sensitivity criteria is particularly suitable to compare the near-term answers between species and will be selected to feed the macro-criterion Vulnerability in the Analysis and Diagnosis Practices. The selection of a single criterion among the criteria feeding the Vulnerability macro-criterion will respect the parsimony approach (simple equation) and lead to an acceptable level of uncertainty.
4. Final output of the scoping: the output of the scoping will be to use a Trait-based vulnerability assessment based only on Sensitivity criteria to sea surface temperature.

Other stressors could be considered for long-term projection such as deoxygenation and bathymetry.

Generic recommandations: - Focus on speed limits inside MPA and in known key life-cycle areas and migration routes. To support the identification of key life-cycle areas and migration routes, use the criteria Ecological corridors/Migration routes, Nurseries and breeding grounds and Developmental and Feeding/Foraging habitats. Other criteria can be found in the macrocriterion Functional Hotspots (Presence of key functional species and areas). These criteria can be found in the D3.4 (c.f. notes).

MSPdF Classification: *Marine & Coastal Environment -> Ecosystem: Species Marine & Coastal Environment -> Ecosystem: Habitat Marine & Coastal Environment -> Ecosystem: Ecosystems, including food webs Marine & Coastal Environment -> Pressure: Biological Marine & Coastal Environment -> Pressure: Physical Marine & Coastal Environment -> Pressure: Substances, litter and energy Maritime Activities and MSP*

Notes

See example of application of Life-cycle critical areas and Functional Hotspots macrocriteria in D3.4 - Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable

See example of application of vulnerability macrocriterion in D3.4 - Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

Applications

- *Marime Mammals & CC: NW Mediterranean prioritization for 2030*

7.45 Q 49 - How to manage cross-border MPAs for cetaceans conservation?

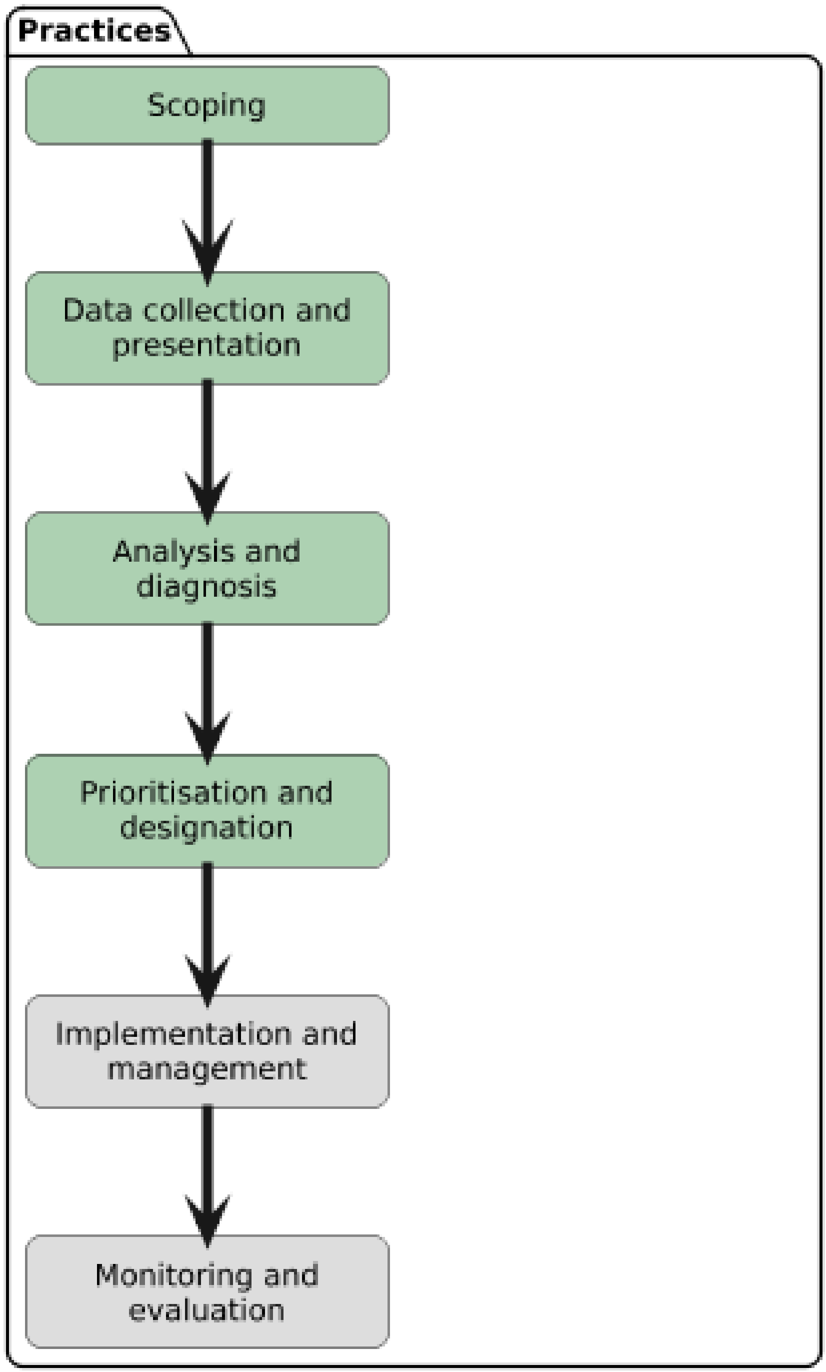
Broader "Question"

- *Q 10 - How to protect marine mammals?*

Related sites

- *North-Western Mediterranean (NW-MED)*

7.45.1 Answers



ESE1 - Ecological toolkit

Practices: *Implementation and management*
Spatial scales: Transboundary / sea basin
Protection regimes: Non-strict protection
Marine zones: Offshore zone

Criteria classes: *1.1.1 Vulnerability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Functional hotspots*
    - Macro-criterion *Life cycle critical areas*

Implementation details

Co-management of cetaceans from an ecological point of view means creating a network of observers, sharing data to facilitate the monitoring and identification of critical life cycle areas (e.g. nursery areas, breeding areas and feeding areas) and migration zones (ecological corridors, steppingstone areas), and agreeing on management measures, particularly in shipping corridors and fishing zones (high anthropogenic impact areas). To reduce risks and impacts on marine mammals, the management lever promoted is to reduce speed limits inside MPA and in known key life-cycle areas and migration routes.

7.46 Q 48 - How to reduce risks (e.g. of collision) and impacts (e.g. from noise pollution) on key cetacean species, particularly during the breeding season and in sensitive areas?

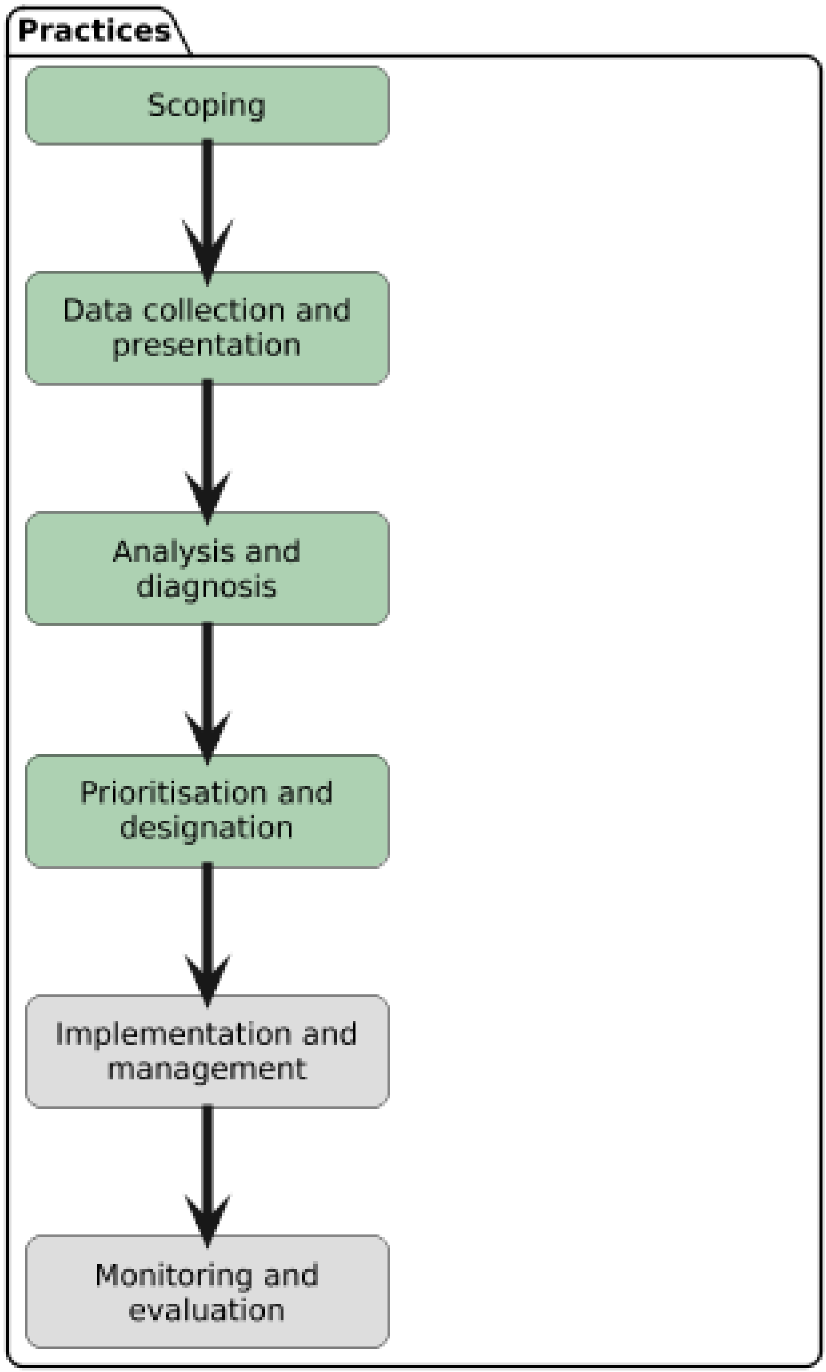
Broader "Question"

- *Q 10 - How to protect marine mammals?*

Related sites

- *Western Black Sea*

7.46.1 Answers



ESE1 - Ecological toolkit

Practices: *Implementation and management*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Offshore zone

Criteria classes: *1.1.4. Life cycle critical areas 1.4 Ecological status*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Life cycle critical areas*
  - Subcategory *Ecological status*

Implementation details

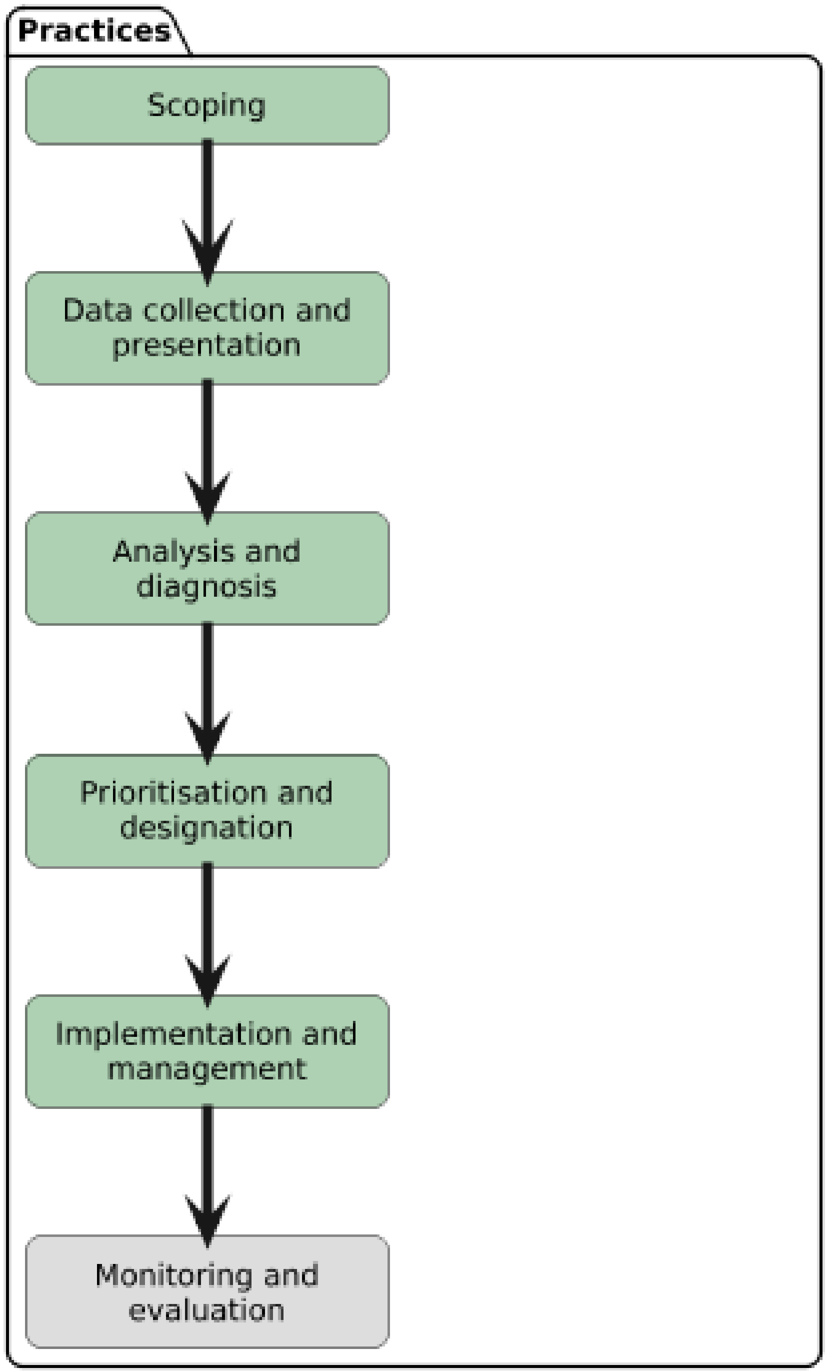
In general, to reduce risks and impacts on marine mammals related to boating and shipping, the management lever promoted is to reduce speed limits inside MPA and in known key life-cycle areas and migration routes. To support the identification of key life-cycle areas and migration routes, used the ESE1 criteria Ecological corridors/Migration routes, Nurseries and breeding grounds and Developmental and Feeding/Foraging habitats. Other criteria can be found in the macro-criterion Functional Hotspots (Presence of key functional species and areas).

7.47 Q 52 - How to protect pelagic habitats?

Related sites

- *North-Western Mediterranean (NW-MED)*

7.47.1 Answers



ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

Spatial scales: Transboundary / sea basin National

Protection regimes: Non-strict protection

Marine zones: Deep sea Offshore zone

Implementation details

- Identify specificities and issues for each pelagic zone (e.g., environments are dynamic and ephemeral, species could present complex life cycles and occupy massive home ranges as they are higly mobiles), including relative key structuring species (from plancton to top predators including seabirds, sharks and cetaceans). This specifities make it particularly challenging to conserve and include both species of high conservative and economc interest (small pelagics such as anchovies and mackerels).
- Temporality and physical parameters are a central problematic in pelagic ecosystems (nutrients, light, salinity, temperature, river input…), project current and future physical conditions in the area of interest. Identifiy areas under threats (where conditions will change the most) and climate refugia using anomalies analysis. Emphasis on terrestrial and marine linkages.
- Identify favourable conditions of phytoplankton blooming to identify potential blooming areas based on physical layers adn anomalies analysis as pelagic habitats create the foundation for marine food webs, home to primary producers such as phytoplankton and microbes. These habitats are highly dynamic and exhibit swift responses to environmental variables such as large phytoplankton blooms.
- Identify actual knowledge on connectivity, especially known larval and movement pathways.
- Project vulnerability of species to relevant anthropogenic and climatic stressors (especially salinity and …) and, for mobile species, perform velocities analysis to determine potential migration roads under different climatic scenarios. Duplicate the approach to all the species of interest to switch to an ecosystem-based approach.
- Implement all projections in a single tool (Marxan, PrioritiseR…) to define different MPA networks designs (prioritising facilitation of movements and integration of climate-smart areas while covering essential habitats for the life cycle, prioritising ecosystem stability and functionning) integrating all area-based management tools (EBSA, OECM, MPA…) in a single management framework. It aims to better conserve relevant species life-cycle (including larval and adult connectivity) and essential habitats without multiplying the number of MPA. Ensure that the measures are sufficient and the area managed through adaptive management.
- Develop the network ensuring communication and alignement between the selected areas and enter in the trade-off phase following recommendations of ESE3.
- Develop broaders less restrictive management levers than in the MPA per se (reduction of speed limit, gear restrictions, depredation structures…) to limit incidence of bycatch and stressors on key species between the protected areas based on international agreements.
- Develop monitoring aspect.

7.48 Q 41 - What are the main objectives and elements of monitoring programs for MPAs?

Narrower "Questions"

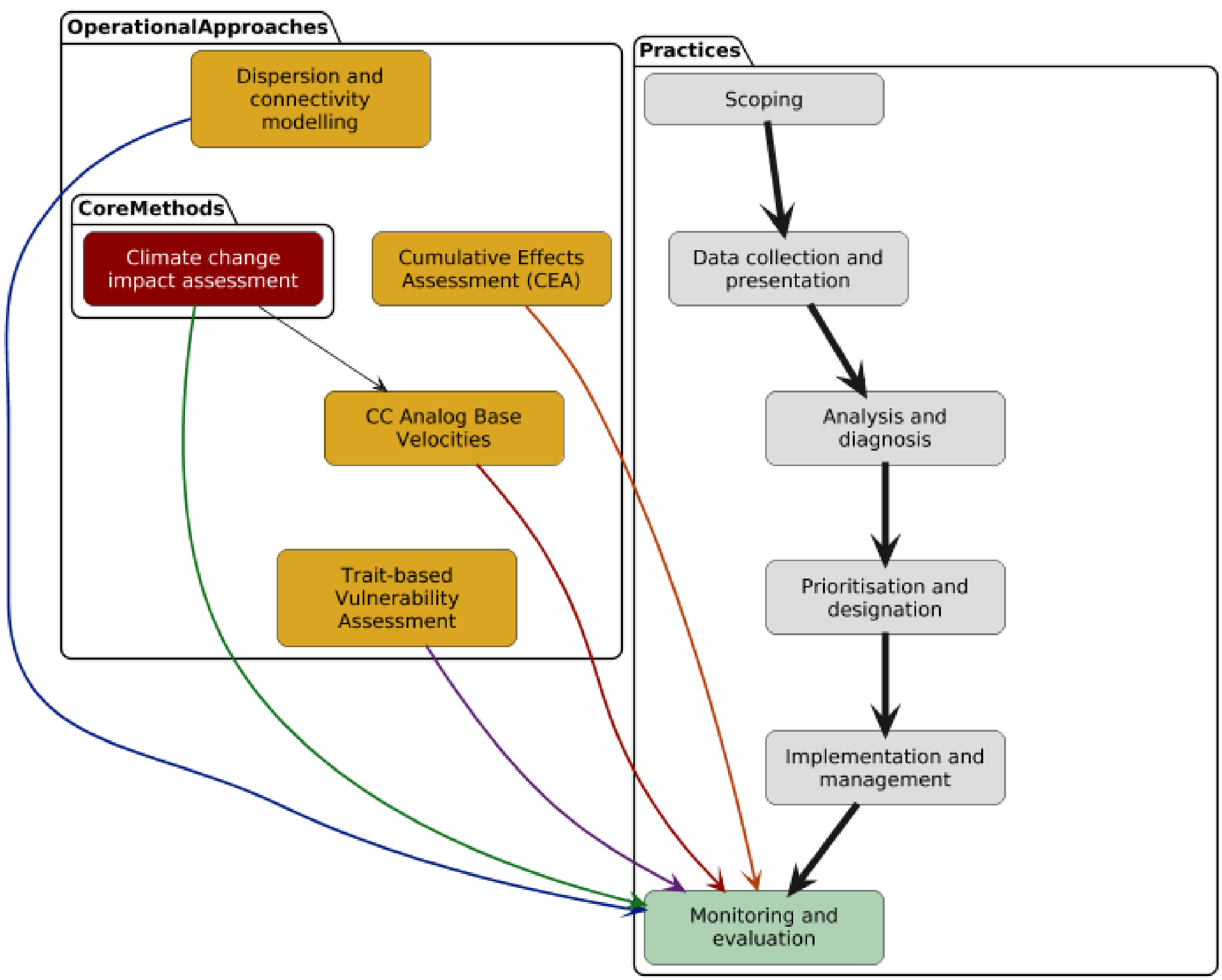
- *Q 43 - How to monitor Ecosystem Services highlighting their linkages to the different high priority socio-economic criteria identified in each site?*
- *Q 42 - What monitoring approach can be taken for extensive MPA networks, expecially offshore ones?*

Related sites

- *Baltic Sea basin and Vistula Lagoon/Southern Baltic*

Notes ESE 1: Focus on ecological and climatic criteria only, need to be combined with the others ESE to include socio-economical criteria

7.48.1 Answers



Operational approaches

- *Dispersion and connectivity modelling* (Dispersion and connectivity modelling)
- *Cumulative Effects Assessment (CEA)* (Cumulative Effects Assessment (CEA))
- *Climate change impact assessment* (Climate change impact assessment)
- *CC Analog Base Velocities* (Climate change impact assessment)
- *Trait-based Vulnerability Assessment* (Trait-based Vulnerability Assessment)

ESE1 - Ecological toolkit

Practices: *Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Criteria classes: *1 Ecological and genetic criteria 1.1 Functional 1.1.1 Vulnerability 1.1.2 Stability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas 1.1.5 Climate-smart potential 1.2 Structural 1.3 Genetic*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    * Macro-criterion *Vulnerability*
    * Macro-criterion *Stability*
    * Macro-criterion *Functional hotspots*
    * Macro-criterion *Life cycle critical areas*
    * Macro-criterion *Climate-smart potential*
  - Subcategory *Structural*
  - Subcategory *Genetic*

Operational approaches: *(Method) Dispersion and connectivity modelling (Method) Cumulative Effects Assessment (CEA) (Method) Climate change impact assessment (Tool) CC Analog Base Velocities (Method) Trait-based Vulnerability Assessment*

Implementation details

I - Main objective: Ecological monitoring aims at inferring causes of ecosystem changes, by measuring ecosystem state variables in space and time. It serves to anticipate and reduce the impacts on the socio-environment of both anthropogenic and climatic stressors.This answer merged Climatic and Ecological purposes.

II- Elements of monitoring program: General Comment:

- MPA scale
- Identify specifities of the MPA regarding literature and adjacent areas (build the state of art). Decisions must be based on accurate scientific knowledge and ecosystem and climatic projections, including ecological, physical, and sociological features.
- Define commonly accepted management objectives (conservation and management targets) based on vulnerability assessment (Risk analysis) and fully operational strategies based on up-to-date available scientific knowledge identified previously. It should be legally feasible, socially acceptable, and possible

actions existing government systems can take with available resources or data. Ideally, objectives should be quantitative with clear scale and thresholds.

- Develop adequate surveys taking into account local uses dynamics and potential of evolution (including social, institutional, technological and cultural change)
- Select relevant indicators to track the status of the features (e.g., physical, biological, genetics or uses dynamics). Ideally indicators should be quantitative with clear scale and thresholds (S.M.A.R.T). Indicators should be carefully selected according to those existant or could be locally design if needed. In that case, the new indicators should link specific objectives of the MPA to most general objectives at broader scales.
- Reiterate regularly the risk analysis based on up-to-date informations on ecological and uses trends
- Develop an adequate information transmission about future trends in the area to users and decision-makers to ensure a rapid and flexible adaptation of uses if needed and prevents future impacts. Keep in mind the desirable outcomes of the monitoring and the recommendations needed. Following the results, the output of the monitoring phase provide clear recommendations for relevant and targeted users.

Network scale - Promote MPA collaboration and exchanges (building community of actors) to anticipate potential changes appearing in adjacent areas, to identify most efficient management lever for a same issue and to promote cooperative management of moving management targets (e.g., connectivity (larval and adult phase), migratory species, pelagic populations)

- Target-selection specificities:

1) Select species based on relevant ecological status (IUCN, GFCM, Barcelona convention…)
2) Include genetic diversity in the risk analysis

3) Emphasize the inclusion of species and habitats that are functionnally important per se (e.g. promoting mitigation) and to sustain other species life cycle (e.g., engineers species, nurseries and feeding areas) - Assess species vulnerability to climatic and anthropogenic stressors, including near-term and mid-term projections. Eventually on a second step, include long-term projections to develop a step-by-step actions calendar. - Select a pannel of management targets (e.g., species, habitat, uses…) answering to the different management objectives identified in the area used as proxy of sensitivity (e.g., sensitivity traits (cf Cambra et al., 2024) or VME criteria such as Uniqueness or rarity, Functional significance of the habitat, Fragility to human disturbance, Life-history traits that make recovery difficult, Structural complexity), adaptativity (Cambra et al., 2024 p°74) and mitigation potential.

Physical monitoring specificities related to CC: - Identify relevant Climatic stressors in the MPA (e.g., Time of Emergence - ToE) - Identify the sequence of apparition of CC stressors in the area (through projection of ToE, early warning) - Implement adequate monitoring and indicators for each term of projection (quantitatives and shared within the MPA networks), both physical and biologic - Communicate with southwards and connected MPA to align management plans and consider early warning coming from adjacent areas

Notes

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n°101060707)

ESE2 - Criteria for the representation of the social and economic dimension of MPAs

Practices: *Monitoring and evaluation*
Spatial scales: National Regional / local
Protection regimes: Strict protection Non-strict protection

Criteria classes: *5 Socio–economic & governance criteria*

Criteria

- Category *Socio–economic & governance criteria*
  - Subcategory *Socio–economic criteria*
    - Criteria *Area important because it allows access to relevant areas for the marine users.*
    - Criteria *Area important for locally-caught seafood*
    - Criteria *Area important for the generation of employment and income linked to non traditional activities*
    - Criteria *Area important for fishery activity*
    - Criteria *Area important for dredging*
    - Criteria *Area important because of the presence of structure with significant historical and cultural. (mo*
    - Criteria *Area of high scientific interest*
    - Criteria *Area important for educational interest*
    - Criteria *Area important because of the occurrence of iconic species/habitats for the local community*
    - Criteria *Area important for thehealth of coastal residents and/or resource users (mental health, physical hea*
    - Criteria *Area important due to the socio-cultural dependence of the coastal community with its environ*
    - Criteria *Area important to be managed due to the presence ofspatial conflicts among users*
    - Criteria *Area important because of the presence of cultural symbolic value*
    - Criteria *Area important for recreation and leisure*
    - Criteria *Area important because of the presence of cultural and tradition activities that support local fo*
    - Criteria *Area important for traditional human settlement, land-use, or sea-use which is representative of*
    - Criteria *Area with high scenic and/or aesthetic value*
    - Criteria *Area important for shipping*
    - Criteria *Area is important for the development of blue economy activities*
    - Criteria *Area with current/potential importance to explore and demonstrate approaches and management solution*
  - Subcategory *Governance criteria*
    - Criteria *Equity*

* Criteria *Clear strategic plan for the development of sustainable blue economy*
* Criteria *Cross-border cooperation*
* Criteria *Decision making is based on best information and knowledge available*
* Criteria *Strategic Environmental Assessment*
* Criteria *Monitoring and evaluation*
* Criteria *Instruments to ensure and guide development and implementation of marine policies*
* Criteria *Sustainable fishing management*
* Criteria *Climate change measures established*
* Criteria *Ecosystem based management approach*
* Criteria *Long term strategic adaptive management*
* Criteria *Coherence management of the area*
* Criteria *Stakeholder participation*

Implementation details

Suggestion for Monitoring Programs for MPAs based on the socio-economic and governance criteria. Deliverable 4.1 from the MSP4Bio Project provides a structured, participatory process to prioritize these criteria, ensuring that local priorities are collaboratively addressed. Each socio-economic criterion is linked to ecosystem services, aligning conservation objectives with socio-economic needs. Monitoring programs for MPAs should integrate socio-economic criteria to assess both ecological and societal impacts, aligning conservation goals with human needs. Key recommendations include: 1. Evaluate Across MPA Types: o Tailor monitoring efforts based on MPA categories (strict protection, conservation focus, multiple-use) to balance ecological preservation with sustainable resource use. 2. Incorporate Socio-Economic Criteria: o Use criteria such as economic importance (e.g., fisheries, blue economy), cultural dependence (e.g., heritage preservation), and employment contributions to measure MPAs' societal benefits. 3. Adapt Management Based on Data: o Leverage monitoring results to refine strategies, addressing socio-economic challenges while ensuring ecological success. This approach not only ensures MPAs meet their objectives but also highlights their value to society.

Notes

Supporting material: Pegorelli C, De Andres M, Garc´ıa-Onetti J, Rayo S and Garc´ıa-Sanabria J (2024) Marine protected areas as socio-economic systems: a method for defining socio-economic criteria in marine planning. Front. Mar. Sci. 11:1358950. doi: 10.3389/fmars.2024.1358950

Pegorelli, C., de Andres, M., Onetti, J., Lees, L., Calado, H., Gutierrez, D., García Sanabria, J.(n.d.). Aligning socio-economic and governance criteria for integrated marine spatial planning and conservation frameworks. In development. University of Cádiz, Spain.

7.49 Q 43 - How to monitor Ecosystem Services highlighting their linkages to the different high priority socio-economic criteria identified in each site?

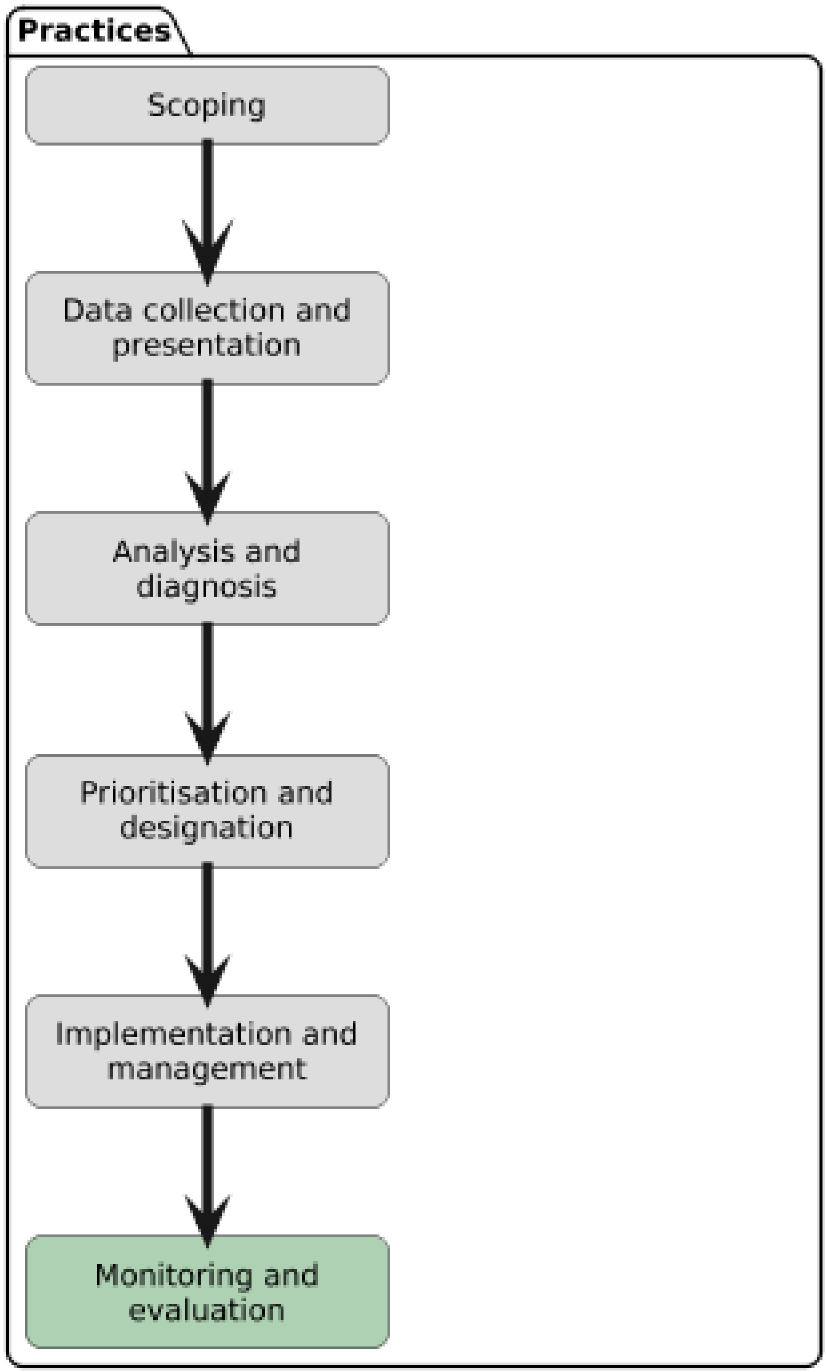
Broader "Question"

- *Q 41 - What are the main objectives and elements of monitoring programs for MPAs?*

Related sites

- *Gulf of Cadiz*

7.49.1 Answers



ESE2 - Criteria for the representation of the social and economic dimension of MPAs

Practices: *Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Criteria classes: *5.1 Socio–economic criteria*

Criteria

- Category *Socio–economic & governance criteria*
  - Subcategory *Socio–economic criteria*

Implementation details

Monitoring and assessing ecosystem services requires a combination of local knowledge, socio-economic and environmental data, relevant indicators, and mapping tools. Deliverables 4.1, 4.2 D3.3 of the MSP4Bio project offer methodologies and frameworks to support this process, ensuring a comprehensive and tailored approach.

Identification of Key Ecosystem Services – locally craft The first step in addressing this question is to identify high-priority ecosystem services. It is recommended to categorize these services using the Common International Classification of Ecosystem Services (CICES) framework, for example: • Provisioning Services: Fisheries, aquaculture, and genetic materials. • Regulating Services: Climate regulation, erosion control, and water purification. • Cultural Services: Recreation, education, and heritage value. • Supporting Services: Biodiversity conservation and habitat provision. The ranking of ecosystem services can be locally adjusted based on scientific and local knowledge, as presented in Deliverable 4.1 of the MSP4Bio project. Local issues can be emphasized using participatory tools such as Rapid Ecosystem Services Participatory Appraisal (RESPA) to gather community perceptions and refine the valuation of services (Rey-Valette et al., 2017). Defining Scope and Priorities Socio-economic criteria can support in establishing the importance of ecosystem services for human communities. Integrating socio-economic criteria into the evaluation of ecosystem services is essential for justifying and prioritizing monitoring actions and management interventions to address pressures from marine activities. To monitor and evaluate priority ecosystem services, it is necessary to: 1. Identify target priorities (e.g., the human uses and the species, habitats, and areas delivering services). 2. Determine human activities that disturb or benefit from these services. Deliverable 4.1 outlines a methodology to define socio-economic criteria and their associated ecosystem services. Deliverable 4.2 applies the DPSIWR framework (Driver-Pressure-State-Impact-Wellbeing-Response) to link marine activity pressures to potential ecosystem changes. Moreover, highlighting the relationship between human well-being and ecosystem integrity is a core aspect of risk analysis (cf. D3.3). Selecting relevant indicators is critical and involves: • Reviewing indicator catalogs and literature. • Developing tailored indicators based on current scientific knowledge, incorporating ecological, sociological, and economic components specific for the area of interest.

Selecting and Using Indicators for Ecosystem Services Monitoring Although not covered in MSp4Bio, indicators are essential tools for monitoring and assessing ecosystem services. They provide measurable variables that help track changes in ecosystems and evaluate the effectiveness of management actions. Developing and selecting appropriate indicators involves tailoring them to specific ecosystem services to ensure they capture relevant ecological, social, and economic dynamics of an specific area. For example, Barragán Muñoz and Borja Barrera (2011) propose indicators linked to different types of ecosystem services, for example: • Provisioning Services (e.g., food production): Fresh fish landings serve as an indicator of the provisioning service of extractive fishing. Additionally, Schwantes et al. (2024) introduced an Essential Ecosystem Service Variables (EESV) framework, categorizing indicators into six classes to provide a comprehensive structure for ecosystem services monitoring: 1. Ecological Supply: Captures the ecosystem's capacity to deliver services. 2. Use: Tracks the extent of human utilization of the services. 3. Demand: Measures the need or dependency on specific services. 4. Anthropogenic Contribution: Reflects human activities' influence on ecosystem services. 5. Instrumental Value: Quantifies tangible benefits derived from ecosystem services. 6. Relational Value: Highlights the cultural, emotional, and ethical importance of ecosystem services. When selecting indicators, it is essential to consider multiple metrics to capture a comprehensive picture of an ecosystem service. For example, indicators like Catch Per Unit of Effort (CPUE) for fisheries may have inherent biases, such as assumptions of proportionality between catches and stock abundance, which can lead to over- or underestimations. Mapping and combining different indicators through tools like GIS and participatory approaches provide a clearer spatial and contextual understanding of ecosystem services. This integration helps prioritize monitoring efforts, ensuring that management actions are data-driven and effective.

Notes

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n°101060707)

Schwantes, A. M., Firkowski, C. R., Affinito, F., Rodriguez, P. S., Fortin, M.-J., & Gonzalez, A. (2024). Monitoring ecosystem services with essential ecosystem service variables. Frontiers in Ecology and the Environment, 22(8), e2792. https://doi.org/10.1002/fee.2792

Barragán Muñoz, J. M., & Borja Barrera, F. (2011). Evaluación de los ecosistemas del milenio de España: Litorales. Universidad de Cádiz, Facultad de Ciencias del Mar. Universidad de Huelva, Departamento de Historia II.

Deliverable 4.1 of MSP4BIO (2024). Criteria for the representation of the social and economic dimension of MPAs. University of Cádiz, MSP4BIO Project funded by the European Commission, Horizon Europe. MSP4BIO project (GA n°101060707)

Deliverable 4.2 of MSP4BIO (2024). Guideline for the strategic and spatial measures for the nature-inclusive operation of blue economy sectors. University of Cádiz, MSP4BIO Project funded by the European Commission, Horizon Europe. MSP4BIO project (GA n°101060707) .

7.49.2 Measures

Policy solutions

Practices: *Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

7.50 Q 42 - What monitoring approach can be taken for extensive MPA networks, expecially offshore ones?

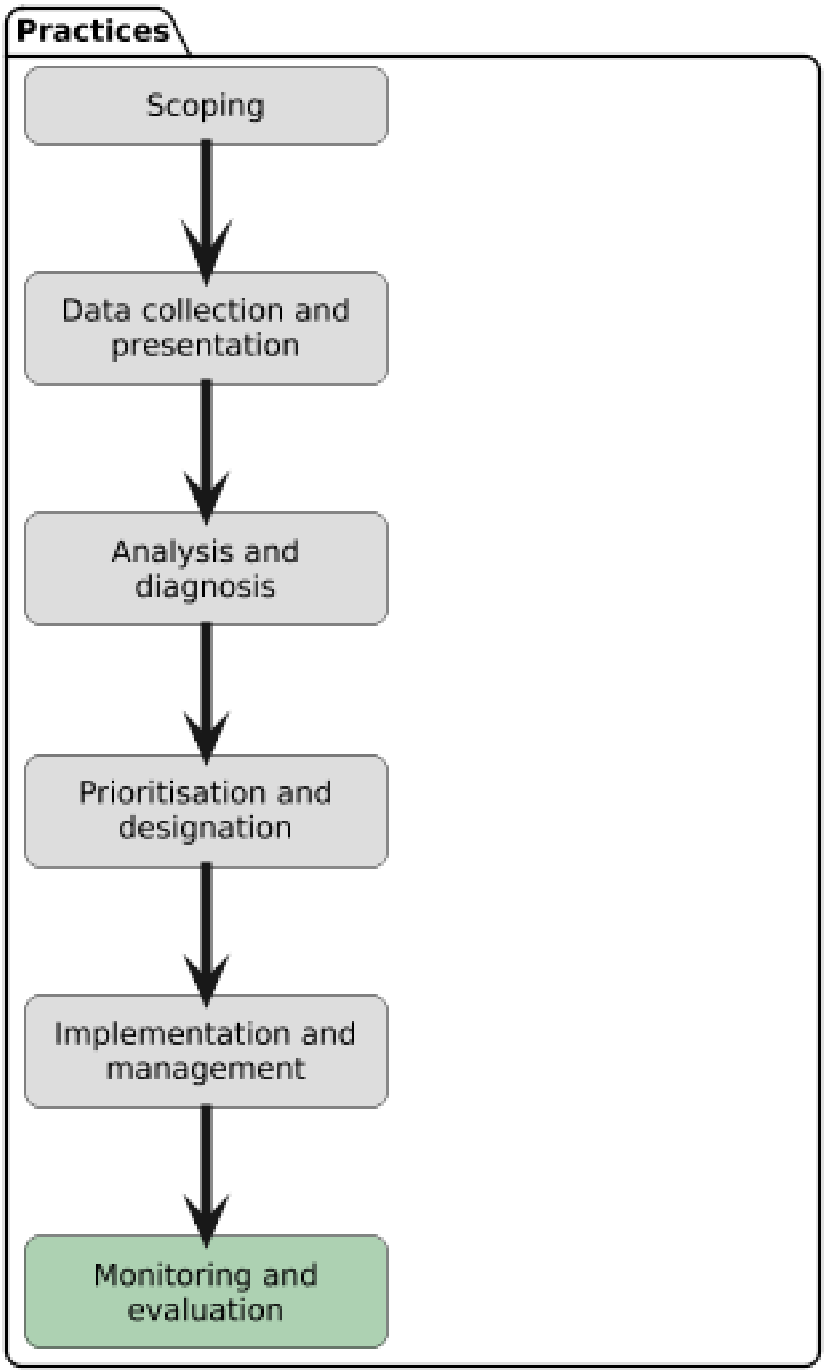
Broader "Question"

- *Q 41 - What are the main objectives and elements of monitoring programs for MPAs?*

Related sites

- *Azores Archipelago*

7.50.1 Answers



ESE1 - Ecological toolkit

Practices: *Scoping*
Spatial scales: Transboundary / sea basin National
Protection regimes: Strict protection Non-strict protection
Marine zones: Offshore zone

Criteria classes: *1 Ecological and genetic criteria 1.1 Functional 1.1.1 Vulnerability 1.1.2 Stability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas 1.1.5 Climate-smart potential 1.2 Structural 1.3 Genetic*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Stability*
    - Macro-criterion *Functional hotspots*
    - Macro-criterion *Life cycle critical areas*
    - Macro-criterion *Climate-smart potential*
  - Subcategory *Structural*
  - Subcategory *Genetic*

Implementation details

Monitoring approaches that can be utilized for extensive MPA networks, especially offshore ones will depend on factors such as cost, time, feasibility and resources both technological and human (i.e. participants involved). Monitoring approaches should prioritize areas, habitats and species based on these factors and can involve satellite monitoring, telemetry (e.g. tags on sharks undertaking migrations) and eDNA (sampling that can provide data for species that have extensive distributional ranges or/and for example with cryptic behaviour, i.e. difficult to detect through observations). The approaches should also prioritize Life cycle critical areas (e.g. ecological corridors and nursery areas) and functionally important areas (e.g. Functional Hotspots inner criteria - presence of key functional species and key functional areas (e.g. primary productivity areas, larval source areas) and areas such as Ecologically or Biologically Significant Areas (EBSAs) and Vulnerable Marine Ecosystems (VMEs) that can be both functionally important and vulnerable to anthropogenic impacts (see Vulnerability and Stability macro-criteria).

Please refer to answer 17 as well which describes some monitoring approaches for pelagic biodiversity and due to the importance of connectivity for this question, consulting Section 4 “Connectivity” of D3.1 Critical review on multilevel ecological processes to improve systemic biodiversity protection and restoration strategies in Europe.” and Section 3.2.4.1 through to 3.2.4.3 of D3.2 “Portfolio of improved ecological criteria to be applied in biodiversity protection and restoration for project testing sites.”

Notes

Bongiorni L et al (2023) Critical review on multilevel ecological processes to improve systemic biodiversity protection and restoration strategies in Europe. Deliverable – D3.1., under the WP2 of MSP4BIO project (GA n° 101060707)

Bongiorni L., Bekaert M., Jusufovski D., Bocci M., Gissi E., Magaldi M., Sciascia R., Rombouts I., Costa A., Barbanti A., Pınarbaşı K., Withouck I., Kotta J., Whatley L., Barboza F.R. (2023) Portfolio of improved ecological criteria to be applied in biodiversity protection and restoration for project testing sites. Deliverable – D3.2., under the WP3 of MSP4BIO project (GA n° 101060707)

7.51 Q 39 - What criteria are available to assess sustainability of maritime uses?

Narrower "Questions"

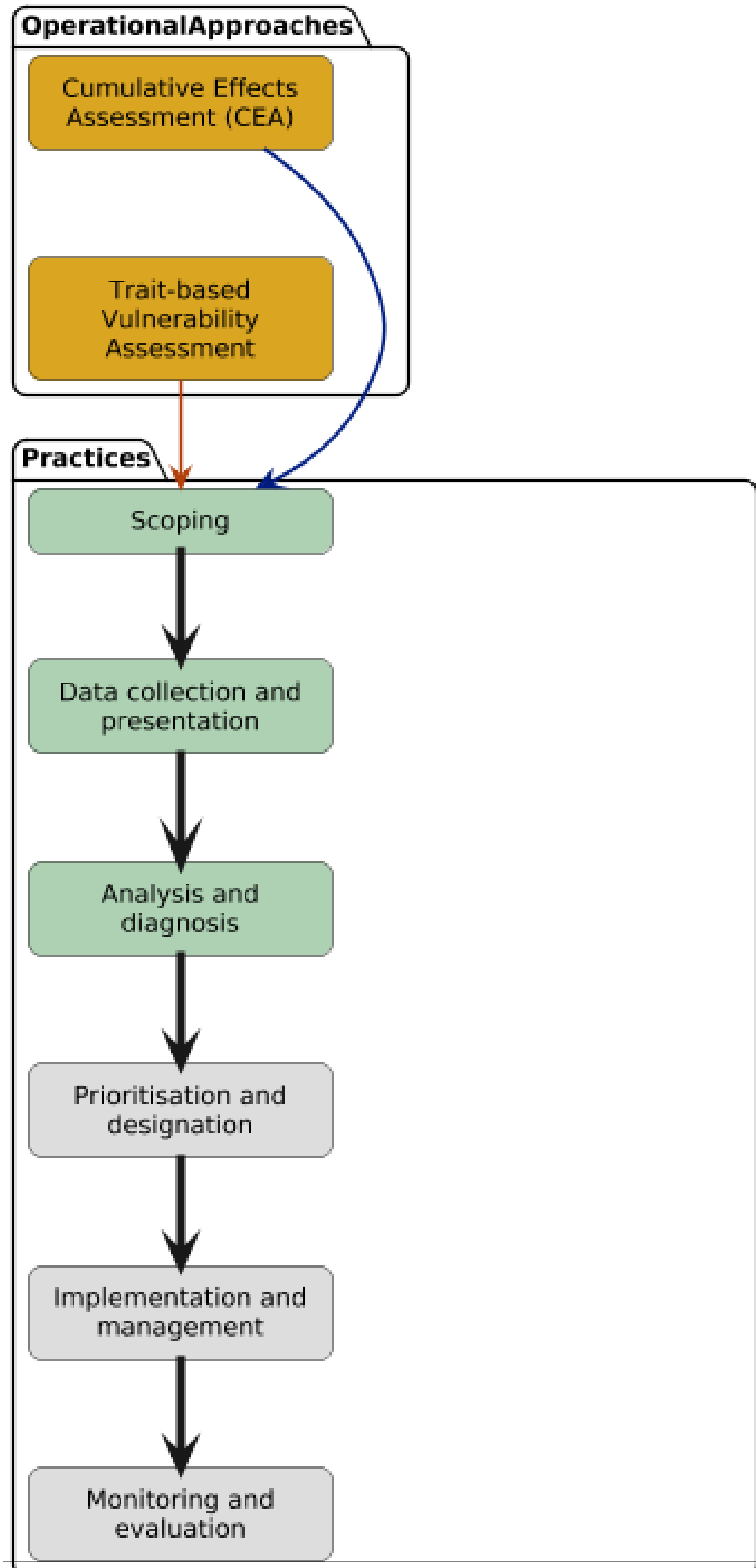
- *Q 14 - How to assess compatibility of maritime uses and MPA conservation objectives? How to prioritize uses?*

Related sites

- *Western Black Sea*

Notes ESE 1: Focus on ecological and climatic criteria only, need to be combined with the others ESE to include socio-economical criteria

7.51.1 Answers



Operational approaches

- *Cumulative Effects Assessment (CEA)* (Cumulative Effects Assessment (CEA))
- *Trait-based Vulnerability Assessment* (Trait-based Vulnerability Assessment)

ESE1 - Ecological toolkit

Practices: *Scoping*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Criteria classes: *1 Ecological and genetic criteria 1.1 Functional 1.1.1 Vulnerability 1.1.2 Stability 1.1.3 Functional hotspots 1.1.4. Life cycle critical areas 1.1.5 Climate-smart potential 1.2 Structural 1.3 Genetic 1.4 Ecological status*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*
    - Macro-criterion *Stability*
    - Macro-criterion *Functional hotspots*
    - Macro-criterion *Life cycle critical areas*
    - Macro-criterion *Climate-smart potential*
  - Subcategory *Structural*
  - Subcategory *Genetic*
  - Subcategory *Ecological status*

Operational approaches: *(Method) Cumulative Effects Assessment (CEA) (Method) Trait-based Vulnerability Assessment*

Implementation details

Methodological criteria: - Decisions based on accurate scientific knowledge and ecosystem-based and climatic projections - Develop adequate surveys taking into account local uses dynamics (including social, institutional, technological and cultural change) and potential of evolution - Reiterate regularly the risk analysis based on up-to-date informations on ecological and uses trends

Ecological criteria: - Ensure low impact on marine species and habitats 1) Avoid and minimize the impacts on key areas for functional and life cycle purposes, from species to ecosystem scale 2) Avoid and minimize the impacts on vulnerable species (to anthopogenic or climatic stressors) 3) Enhance risk spreading through the trophic network (split the stressors between species to maintain ecosystem integrity and stability whereas supporting ecosystem services) - Promote persistence, resistance and recovery of damaged ecosystems

Climatic: - Ensuring the climate-smart potential of each use: 1) Enhance resilience, adaptation and mitigation (limited pressure on vulnerable species and habitats, activity potential to switch towards more sustainable practices) 2) Reduce greenhouse gas emissions 3) Contribute to food security (maintenance or development) 4) Promote social equity and well-being - Ensuring the adequate monitoring of both CC incidence (e.g., Time of emergence) to reevaluate the "sustainable" potential of each activities - Develop an adequate information transmission about future trends in the area to users and decision-makers to ensure a rapid and flexible adaptation of uses and prevents future impacts

ESE2 - Criteria for the representation of the social and economic dimension of MPAs

Practices: *Analysis and diagnosis Monitoring and evaluation*
Spatial scales: National Regional / local
Protection regimes: Strict protection Non-strict protection

Criteria classes: *5 Socio–economic & governance criteria*

Criteria

- Category *Socio–economic & governance criteria*
  - Subcategory *Socio–economic criteria*
    - Criteria *Area important because it allows access to relevant areas for the marine users.*
    - Criteria *Area important for locally-caught seafood*
    - Criteria *Area important for the generation of employment and income linked to non traditional activities*
    - Criteria *Area important for fishery activity*
    - Criteria *Area important for dredging*
    - Criteria *Area important because of the presence of structure with significant historical and cultural. (mo*
    - Criteria *Area of high scientific interest*
    - Criteria *Area important for educational interest*
    - Criteria *Area important because of the occurrence of iconic species/habitats for the local community*
    - Criteria *Area important for thehealth of coastal residents and/or resource users (mental health, physical hea*
    - Criteria *Area important due to the socio-cultural dependence of the coastal community with its environ*
    - Criteria *Area important to be managed due to the presence ofspatial conflicts among users*
    - Criteria *Area important because of the presence of cultural symbolic value*
    - Criteria *Area important for recreation and leisure*
    - Criteria *Area important because of the presence of cultural and tradition activities that support local fo*
    - Criteria *Area important for traditional human settlement, land-use, or sea-use which is representative of*
    - Criteria *Area with high scenic and/or aesthetic value*
    - Criteria *Area important for shipping*
    - Criteria *Area is important for the development of blue economy activities*

    * Criteria *Area with current/potential importance to explore and demonstrate approaches and management solution*

  - Subcategory *Governance criteria*

    * Criteria *Equity*
    * Criteria *Clear strategic plan for the development of sustainable blue economy*
    * Criteria *Cross-border cooperation*
    * Criteria *Decision making is based on best information and knowledge available*
    * Criteria *Strategic Environmental Assessment*
    * Criteria *Monitoring and evaluation*
    * Criteria *Instruments to ensure and guide development and implementation of marine policies*
    * Criteria *Sustainable fishing management*
    * Criteria *Climate change measures established*
    * Criteria *Ecosystem based management approach*
    * Criteria *Long term strategic adaptive management*
    * Criteria *Coherence management of the area*
    * Criteria *Stakeholder participation*

Implementation details

To effectively support maritime sustainability, it is recommended to tailor the list of criteria to the specific local context, ensuring a strategic approach to addressing the area's social, economic, and governance dimensions. This can be achieved by following the process outlined in Deliverable 4.1, developed for the Case Studies of the MSP4Bio Project. This deliverable provides a structured approach for prioritizing socio-economic and governance criteria through a participatory process, enabling stakeholders to collaboratively identify and address local priorities.

Notes

Supporting material: Pegorelli et al. (2023). Criteria for the representation of the social and economic dimension of MPAs (Deliverable – D4.1., under the WP4 of MSP4BIO project (GA n° 101060707)).

Pegorelli C, De Andres M, Garc´ıa-Onetti J, Rayo S and Garc´ıa-Sanabria J (2024) Marine protected areas as socio-economic systems: a method for defining socio-economic criteria in marine planning. Front. Mar. Sci. 11:1358950. doi: 10.3389/fmars.2024.1358950

Pegorelli, C., de Andres, M., Onetti, J., Lees, L., Calado, H., Gutierrez, D., García Sanabria, J.(n.d.). Aligning socio-economic and governance criteria for integrated marine spatial planning and conservation frameworks. In development. University of Cádiz, Spain.

7.52 Q 14 - How to assess compatibility of maritime uses and MPA conservation objectives? How to prioritize uses?

Broader "Question"

- *Q 39 - What criteria are available to assess sustainability of maritime uses?*

Related sites

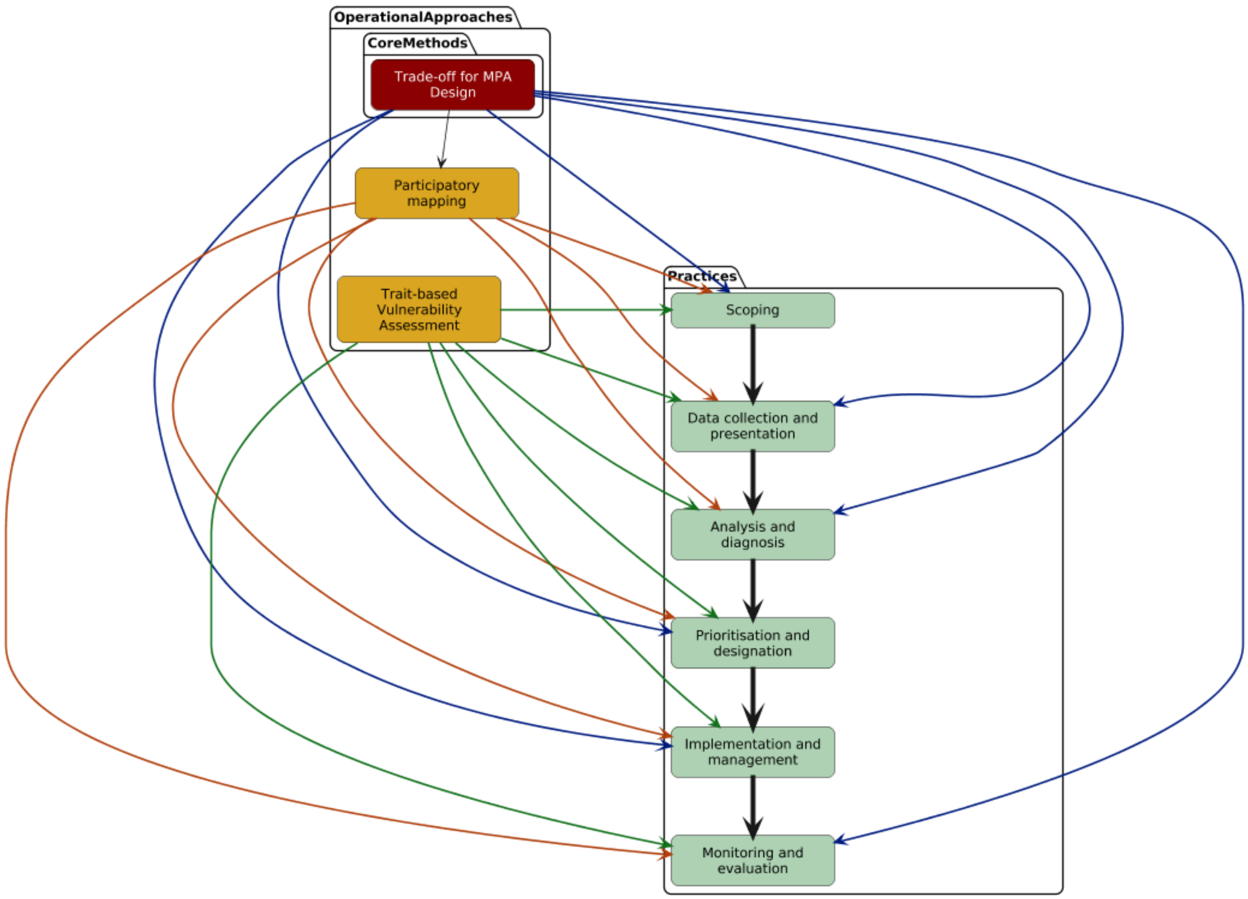
- *Western Black Sea*

- *Belgian part of the North Sea*

Source Matczak et al. (2024) Test Sites Methodology Including the Participation Strategy (Deliverable – D5.2., under the WP5 of MSP4BIO project (GA n° 101060707))

inside the Management questions

7.52.1 Answers



Operational approaches

- *Trade-off for MPA Design* (Trade-off for MPA Design)
- *Participatory mapping* (Trade-off for MPA Design)
- *Trait-based Vulnerability Assessment* (Trait-based Vulnerability Assessment)

ESE1 - Ecological toolkit

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

Spatial scales: National Regional / local

Protection regimes: Non-strict protection

Marine zones: Coastal zone Deep sea Offshore zone

Criteria classes: *1.1.1 Vulnerability*

Criteria

- Category *Ecological and genetic criteria*
  - Subcategory *Functional*
    - Macro-criterion *Vulnerability*

Operational approaches: *(Method) Trait-based Vulnerability Assessment*

Implementation details

Use of the vulnerability assessment methods to identify the uses most likely to impact your conservation targets.

Notes

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n°101060707)

ESE3 - Trade-offs method for protections and restoration in MSP

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

Spatial scales: National Regional / local

Protection regimes: Non-strict protection

Criteria classes: *5 Socio–economic & governance criteria*

Criteria

- Category *Socio–economic & governance criteria*
  - Subcategory *Socio–economic criteria*
    - Criteria *Area important because it allows access to relevant areas for the marine users.*
    - Criteria *Area important for locally-caught seafood*
    - Criteria *Area important for the generation of employment and income linked to non traditional activities*
    - Criteria *Area important for fishery activity*
    - Criteria *Area important for dredging*
    - Criteria *Area important because of the presence of structure with significant historical and cultural. (mo*

- Criteria *Area of high scientific interest*
- Criteria *Area important for educational interest*
- Criteria *Area important because of the occurrence of iconic species/habitats for the local community*
- Criteria *Area important for thehealth of coastal residents and/or resource users (mental health, physical hea*
- Criteria *Area important due to the socio-cultural dependence of the coastal community with its environ*
- Criteria *Area important to be managed due to the presence ofspatial conflicts among users*
- Criteria *Area important because of the presence of cultural symbolic value*
- Criteria *Area important for recreation and leisure*
- Criteria *Area important because of the presence of cultural and tradition activities that support local fo*
- Criteria *Area important for traditional human settlement, land-use, or sea-use which is representative of*
- Criteria *Area with high scenic and/or aesthetic value*
- Criteria *Area important for shipping*
- Criteria *Area is important for the development of blue economy activities*
- Criteria *Area with current/potential importance to explore and demonstrate approaches and management solution*

– Subcategory *Governance criteria*

- Criteria *Equity*
- Criteria *Clear strategic plan for the development of sustainable blue economy*
- Criteria *Cross-border cooperation*
- Criteria *Decision making is based on best information and knowledge available*
- Criteria *Strategic Environmental Assessment*
- Criteria *Monitoring and evaluation*
- Criteria *Instruments to ensure and guide development and implementation of marine policies*
- Criteria *Sustainable fishing management*
- Criteria *Climate change measures established*
- Criteria *Ecosystem based management approach*
- Criteria *Long term strategic adaptive management*
- Criteria *Coherence management of the area*
- Criteria *Stakeholder participation*

Operational approaches: *(Method) Trade-off for MPA Design (Method) Participatory mapping*

Implementation details

Use of the Guidelines for applying trade-off methodology for MPA design (Figure 4) from Deliverable 4.3 “Trade-offs method for protection and restoration in MSP”, including all annexes.

Notes

Use of the method Trade-off for MPA Design.

Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

ESE3 - Trade-offs method for protections and restoration in MSP

7.52.2 Measures

ESE1 - Ecological toolkit

Practices: *Analysis and diagnosis*
Spatial scales: National
Protection regimes: Strict protection
Marine zones: Deep sea

Measures: *Aquaculture - Artisanal Fish Farming Commitments - Code of Good Practice Aquaculture - Community-Based Contracts - Sea Garden Community Fishery - "Who is allowed to fish" - Cultural and Community Approaches/Practices - Industrial fishery restrictions*

ESE3 - Nature-inclusive operation of blue economy sectors

ESE3 - Nature-inclusive operation of blue economy sectors

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

CHAPTER

EIGHT

PRACTICES

8.1 [Not Related to Any Practice]

8.1.1 Description

You don't need to use the practice approach to answer this question..

Edit online (for developers only)

8.2 Scoping

8.2.1 Description

This practice aims to support the identification of the scope of the problem, with reference to the management needs and the specific management question(s). This include the identification of the geographic scope and of the boundaries of the area of interest, the temporal scale the management question refers to, the understanding of the main ecological, governance, social and economics elements of the area, depending on the topic(s) addressed by the management question(s). Understanding ecological significance, biodiversity values and socio-economic importance of MPAs (ore candidate ones) in the area are also supported by this practice. The practice also includes the identification of key stakeholders, including government agencies, local communities, NGOs, researchers, MPA managers and coastal and maritime sectors. The practices supports the identification of all significant elements to be considered in the analysis which should results from a priority-setting exercise where only elements deemed truly significant should be selected. During the scoping phase, the following steps should be undertaken:

- Analysis of the management question. Identification of keywords within the question, such as climate change, sensitivity to human impacts, connectivity, vulnerable marine ecosystems, pelagic species, etc.
- Definition of management objective. Identification of the management objective, e.g., the design of a new MPA, the expansion of an existing MPA, management of existing MPAs or design of a network of MPAs.
- Definition of the management approach. The approach is defined here as either conservative, i.e., applying strict protection based on current scientific and empirical knowledge and limiting the impact of uncertainty on the effectiveness of protection (e.g., promoting the conservation of the list of vulnerable species), or selective, i.e., more pragmatic, taking into account the limited means of ensuring ecological protection and the difficulty of making management trade-offs between conservation and human activities, particularly in heavily used coastal areas (e.g., conserve 75% of the species most likely to survive in an area, conserve flagship species, among others).
- Definition of the context scale. Define whether the scope is at MSP or MPA level.
- Definition of the geographical area. Defines the geographical boundaries or sea basin, possibly delimited by geographical coordinates (latitude and longitude, if available).

- Definition of the spatial scale. The spatial scale depends on the conservation objective, whether it is focused on one or more MPAs, networks of MPAs, at sub-national, national or transboundary scales
- Definition of the temporal scale. The temporal scale is particularly important in the context of climate change, spanning decades to centuries, (for a more detailed definition and guidance on selecting spatial and temporal scales, see section 2.3 in Deliverable D3.3).

In addition, the following information can support scoping:

- Human use involves a wide range of activities, all of which need to be carefully managed to balance ecological conservation with societal benefits. These activities are scaled and regulated to ensure that they are consistent with conservation objectives and support both the protection of marine biodiversity and the socio-economic well-being of local communities.
- Human pressures, pertinent to the examination at hand, encompass a range of anthropogenic activities and their resultant impacts, as detailed in the MSFD and outlined in Annex 1 (D2.2), under Category 3, "Anthropogenic Criteria (Activities and Impacts)". In the scoping phase, human pressures relevant to the research question are identified and defined.
- Climatic stressors are selected based on criteria such as the management question, temporal scale, spatial scale, and management target/level. A compilation of climatic drivers is provided in D2.2 (Annex A: 4.1 drivers) and D3.3 (Table 3). The scoping phase will outline the complexity of the analysis in relation to the management question, encompassing both the species in question and their spatial and temporal boundaries. Climatic stressors are associated with climate drivers like sea surface temperature and storminess, whereas non-climatic stressors encompass anthropogenic and abiotic factors. Within the ESE1 framework, these pressures are viewed as cumulative.

The next steps of the scoping phase are defined differently under the different ESE modules, in the relation with their specific perspective: ecology, governance, socio-economics, policy.

References

- Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)
- Integrated Ecological-Socio-Economic Management Framework - ESE Step-by-Step guidance (with test site examples and lessons learned). Deliverable D4.5 under under the WP4 of MSP4BIO project (GA n° 101060707). In preparation: expected July 2025.

8.2.2 Additional details

ESE1 - Ecological toolkit (Scoping)

Additional steps of the scoping phase, relevant for the ecological aspects:

- Definition of the ecological approach. Clarify whether the approach is area-based, species-based or a combination of both.
- Specification of the bio-ecological target. Identify the elements of priority for conservation, from individual species to ecosystem level, based on the scope and geographical area of the question, specifying the target as precisely as possible (e.g., Vulnerable Marine Ecosystems - VME, whales, Posidonia meadows) and the species level where available (e.g., Eunicella cavolinii). Elements to support decision making in the face of climate change can be found in the D3.3 guide.
- Identification of the criteria to prioritize species/ecosystems for conservation. This step defines the identification of conservation priorities, supported by the lists of species/habitat priority conservation criteria at global, European and regional levels and clustered at the level of geographical regions, as reported in D2.2 (Table 9, Annex 2). Detailed guidance on how to prioritise ecological elements and related criteria is also reported in D3.3, section 2.5. Table 2 in D3.3 reports a step-by-step process, modified from Swan et al. (2017), for identifying key species. The most common strategy is risk or threat assessment (Le Berre et al., 2019). Another strategy is based on vulnerability

to specific threats due to climate change and/or human activities. Other approaches can be based on conservation concerns (intrinsic value of species, e.g., rarity or local distribution and endemism, national importance, genetic or taxonomic uniqueness, phylogenetic distinctiveness) or value of resources or ecosystem services (economic value, attractive species, cultural importance) or ecological distinctiveness (e.g., ecological range, functional role, keystone species, propagation potential, La Berre et al., 2019). The three main criteria for species prioritization are: (1) Services criteria (role that the species deliver to human, including social and economic indicators, generally ranked by the users themselves (D4.1), (2) Ecological criteria (role that the species exerts in the environment and trophic networks that could also be linked to species traits, D2.2 and D3.2) and (3) Climatic/non-climatic criteria linked to species sensitivity (including resistance, recovery and adaptive potential) link to their inner traits (see D3.3). The three rankings will provide a final score that could highlight the species to prioritize regarding the creation of management patterns. This ranking system needs to be defined and is outside the scope of this deliverable.

- Identification of macro-criteria and potential methodological strategies (to be analysed in the following practices). In this step macro-criteria are indicated depending on the other defined scoping steps, and methodological approaches are suggested. This step also guides practices 2-4. When a macro-criterion is identified in the scoping, a selection of inner criteria and suggested methodological strategies will follow (e.g., for vulnerability, cf. Section 3.1.2).

Edit online (for developers only)

8.3 Data collection and presentation

8.3.1 Description

This practice is based on the results of the previous step/practice (Scoping) and involves gathering and organizing all data related to the previously identified species/habitats, macro-criteria and inner criteria with methodological strategies and all additional information (e.g., human activities, exogenous and endogenous drivers) necessary to support the subsequent phases (e.g., Analysis and Diagnosis, Prioritization) as better specified in the Scoping phase. The objective of this practice is also to harmonize the information and make it easily analysable, as well as represent it in an accessible way.

For the collection of information, it is proposed to follow the approach presented by the MSP Data Framework (MSPdF) (Abramic et al., 2023) and subsequently extended and adapted (Menegon et al., 2024). The framework, initially developed to support MSP processes, can more generally be considered suitable for supporting different types of area-based design and management processes. These processes require the collection of spatial data and information related to a great variety of issues and themes.

When facing the data collection task, it is necessary to answer questions such as:

- How can we define the marine environment or marine biodiversity?
- What type of data should be collected and included in the analysis for suitability zoning of economic activities, CEA, or land-sea interactions?
- What are the relevant maritime and coastal uses?
- What type of information needs to be collected within the socio-economic and governance topics?

By utilizing the MSPdF, practitioners can address these questions and ensure that the data collection process is comprehensive, systematic, and aligned with the objectives of the MPA design and management. This framework provides guidance on defining relevant spatial data, identifying key issues and processes, and integrating socio-economic and governance considerations into the data collection and analysis process.

The MSPdF emphasizes organizing the collection of information into thematic clusters to facilitate effective data collection and management. We present a modified version of the MSPdF (…) which also introduces the Ecosystem Services cluster and proposes a

1. Marine & Coastal Environment

2. Marine & Coastal Conservation and Designated sites
3. Oceanographic characteristics and Climate
4. Coastal Land use and Planning
5. Operational maritime activities and Maritime Spatial Planning
6. Socio-economic information
7. Ecosystem Services
8. Governance information

Within each cluster, the MSPdF also proposes detailed approaches for the classification and categorization of information.

References

- Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)
- Integrated Ecological-Socio-Economic Management Framework - ESE Step-by-Step guidance (with test site examples and lessons learned). Deliverable D4.5 under under the WP4 of MSP4BIO project (GA n° 101060707). In preparation: expected July 2025.

Edit online (for developers only)

8.4 Analysis and diagnosis

8.4.1 Description

This practice supports the analysis of the current state of the marine environment and the understanding of the key ecological processes at play. The diagnosis includes understanding the cause-effect relationships, starting from pressures (deriving from human activities and climate change), determining the state (of marine ecosystems and biodiversity) and eventually impacts (already in place or possible, at present and/or in the future).

References

- Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)
- Integrated Ecological-Socio-Economic Management Framework - ESE Step-by-Step guidance (with test site examples and lessons learned). Deliverable D4.5 under under the WP4 of MSP4BIO project (GA n° 101060707). In preparation: expected July 2025.

8.4.2 Additional details

ESE1 - Ecological toolkit (Analysis and diagnosis)

To clarify and quantify the cause-effect nexus, macro-criteria should be assessed by using their respective indicators, and specific DSTs can be applied.

References

- Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

8.5 Prioritisation and designation

8.5.1 Description

Based on the results of previous practices — scoping, data management, analysis & diagnosis — priorities are established for conservation, MPA identification, and management actions within the MPA.

This practice supports the identification of critical areas or habitats that require protection and supports their designation, either wholly or partially, as MPAs.

The practice includes the following steps:

- Defining priority sets: Utilize stakeholder input, expert knowledge, and ecological criteria to establish conservation and management priorities for the MPA. This involves identifying the most critical areas or habitats for protection based on conservation goals and ecological significance.
- Applying conservation algorithms: Use conservation planning software that employs mathematical algorithms to identify priority areas for protection (see Section 4 of D3.4). These tools optimize the selection of protected areas to maximize biodiversity representation and ecological connectivity while considering spatial constraints and conservation targets. The algorithms rely on spatial data layers representing biodiversity features, habitat suitability, ecological processes, and conservation constraints. Additionally, socio-economic data, such as economic value, land tenure, and cultural significance, can be integrated to guide decision-making and ensure a balance between ecological and socio-economic objectives.
- Analyzing results: Evaluate the outputs generated by conservation algorithms to identify potential MPA configurations that best align with conservation goals and priority sets. Assess the spatial distribution of selected areas and their ecological significance within the broader marine landscape.
- Stakeholder engagement: Actively involve stakeholders, including local communities, scientists, government agencies, and non-governmental organizations, throughout the prioritization process. Gather feedback on proposed MPA designs, address concerns, and ensure transparency in decision-making.
- Iterative refinement: Continuously refine the prioritization analysis based on stakeholder feedback, newly available data, and evolving conservation objectives. Regularly update and improve MPA designations to adapt to changing ecological conditions and management needs.

References

- Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)
- Integrated Ecological-Socio-Economic Management Framework - ESE Step-by-Step guidance (with test site examples and lessons learned). Deliverable D4.5 under under the WP4 of MSP4BIO project (GA n° 101060707). In preparation: expected July 2025.

Edit online (for developers only)

8.6 Implementation and management

8.6.1 Description

Implementation of an MPA and its management is based on the control of human activities. Such control can be implemented by: Establishing area boundaries for specific activities, i.e. zoning, including defining no-take areas Enforcing closure during parts of the year critical to the life histories of certain species, or for longer periods Setting size limits, maximum permitted catches and harvest limits on fisheries Prohibiting or limiting destructive practices Issuing permits to control or limit the number of participants engaged in a form of use Limiting access by setting a carrying capacity which may not be exceeded.

It is also essential to control activities outside the MPA boundaries that may affect the long-term viability of the MPA. Some control can be achieved by the creation of contiguous terrestrial protected areas. Local government may have an important role to play in controlling development and other activities in adjacent coastal areas, as a form of integrated coastal management.

Source Kelleher, G. (1999). Guidelines for Marine Protected Areas. IUCN, Gland, Switzerland and Cambridge, UK. xxiv +107pp.

References

- Integrated Ecological-Socio-Economic Management Framework - ESE Step-by-Step guidance (with test site examples and lessons learned). Deliverable D4.5 under under the WP4 of MSP4BIO project (GA n° 101060707). In preparation: expected July 2025.

Edit online (for developers only)

8.7 Monitoring and evaluation

8.7.1 Description

Most MPAs have management plans that set goals and objectives, guiding the evaluation of MPA management effectiveness (ME). Monitoring and assessment play a key role in informing short- and medium-term management decisions and contribute to broader national and international assessments, such as those for the European Union (EU) and the Convention on Biological Diversity (CBD).

Monitoring programs should provide consistent data over time, relying on MPA staff, consultants, NGOs, and researchers. While periodic monitoring exists, management agencies often favor qualitative assessments based on expert interpretation rather than quantitative analyses. However, there is growing interest in better utilizing monitoring data for condition assessments.

The process from monitoring to assessment and final knowledge dissemination is often poorly documented, making it difficult for MPA managers and policymakers to integrate scientific findings effectively. Many MPAs do not use monitoring-based data for management decisions, highlighting the need for stronger connections between science and policy. At regional and global levels, strategic linkages are required to ensure ocean observations inform policies. In the EU, implementing an ecosystem-based approach demands better integration of science, policy, and society, in line with CBD recommendations.

Source Pelletier D. 2020. Assessing the Effectiveness of Coastal Marine Protected Area Management: Four Learned Lessons for Science Uptake and Upscaling. Frontiers in Marine Science 7. https://doi.org/10.3389/fmars.2020.545930

Edit online (for developers only)

CHAPTER

NINE

POLICY SOLUTIONS

9.1 Establishing a dedicated coordination framework for marine biodiversity

9.1.1 Description

General description

Effective marine biodiversity conservation needs a coordinated approach across jurisdictions and sectors. However, fragmented governance structures and the absence of dedicated coordination frameworks often hinder the implementation of comprehensive biodiversity policies (European Commission, 2020; IPBES, 2019). To address this, the proposed solution advocates for the establishment of a dedicated coordination framework—or the strengthening of existing structures—focused specifically on marine biodiversity.

This framework would facilitate regular inter-jurisdictional meetings and policy sessions, fostering collaboration among stakeholders and ensuring that biodiversity priorities are consistently integrated into decision-making processes (Ehler & Douvere, 2009; UNEP, 2021). By enhancing coordination, the framework would streamline efforts, reduce duplication, and align actions with national and international biodiversity goals, such as those outlined in the Kunming-Montreal Global Biodiversity Framework (CBD, 2022). This approach promotes a more cohesive and effective strategy for marine biodiversity conservation.

Main purpose To improve coordination and policy coherence for marine biodiversity conservation, the following actions are recommended:

- Establish a dedicated coordination framework or strengthen existing structures to focus exclusively on marine biodiversity.
- Facilitate regular inter-jurisdictional meetings and policy sessions to align efforts across relevant authorities.
- Enhance cross-sectoral collaboration and data sharing to support informed decision-making.

Barriers addressed:

1. **Fragmented governance structures:**
    - Lack of a centralized body to coordinate biodiversity-related initiatives.
    - Duplication of efforts and inconsistent policy implementation.
    - Limited communication between local, regional, and national authorities.

1. **Insufficient stakeholder engagement:**
    - Weak engagement with key stakeholders, including local communities and industry representatives.
    - Lack of structured forums for dialogue and collaboration.

1. **Policy incoherence:**

- Divergent policies and conflicting priorities across jurisdictions.
- Limited integration of biodiversity considerations into broader maritime planning frameworks.

Policy relevance: This solution directly supports the EUBS2030, which calls for enhanced governance and coordination to achieve biodiversity targets, including the protection of 30% of European seas. By establishing a dedicated framework, this policy solution promotes better alignment with the biodiversity policies, including the MSFD and the MSP Directive. It also contributes to the ecosystem-based approach outlined in EU directives, ensuring that biodiversity considerations are embedded within national and regional maritime planning processes. Implementation

Developing the coordination framework: A dedicated coordination framework should be established through legislative or policy amendments, ensuring clear mandates, roles, and responsibilities for relevant authorities. This framework should facilitate inter-jurisdictional coordination and provide a platform for stakeholder engagement. Regular inter-jurisdictional meetings and policy sessions: Coordination efforts should include periodic meetings involving national, regional, and local authorities to align objectives, review progress, and address emerging challenges in marine biodiversity conservation.

Cross-sectoral collaboration and data sharing: Encouraging collaboration among environmental agencies, fisheries, tourism, and maritime sectors is crucial for integrated management. Establishing shared databases and decision-support tools can enhance data-driven policymaking.

Impact and effort: Impact: High The proposed solution has the potential to significantly enhance marine biodiversity conservation by improving policy coherence, fostering stakeholder engagement, and ensuring efficient resource allocation. Enhanced coordination will lead to better alignment of national and regional priorities, contributing to broader sustainability goals. Required effort: Moderate Implementing this solution requires moderate effort, involving policy adjustments, stakeholder consultations, and capacity-building initiatives. While establishing new structures may take time, leveraging existing frameworks can reduce implementation complexity and accelerate progress toward achieving biodiversity targets. Establish a coordination framework for marine biodiversity: good practices Cross-sector policy alignment: The EU Strategy for the Baltic Sea Region includes a dedicated policy area for spatial planning, which supports the integration of biodiversity considerations into MSP and sectoral policies. The EU Biodiversity Platform offers implementation roadmaps and guidance to align national policies with regional biodiversity objectives, promoting knowledge-sharing and capacity building across countries. Inter-ministerial coordination mechanisms: Regional Sea examples, such as the Baltic Sea HELCOM-VASAB MSP and BioDiv working groups demonstrate how regional bodies can facilitate cooperation across jurisdictions to align biodiversity policies with MSP processes. At national level, France and Italy facilitate cooperation between ministries by aligning marine conservation strategies with economic policies. The Barcelona Convention facilitates cross-border coordination between EU and non-EU countries on marine biodiversity, ensuring integrated policymaking at the Mediterranean level. Germany's inter-agency working groups on MSP and biodiversity provide a model for structured, ongoing collaboration between national ministries and regional stakeholders. Collaboration between EU institutions: Regular dialogue and coordination between the European Commission's DGs (such as DG Environment and DG MARE) create opportunities for enhanced policy coherence, linking biodiversity conservation targets to maritime policies The Greater North Sea Basin Initiative (GNSBI): This initiative brings together stakeholders from multiple North Sea countries to collaborate on MSP, biodiversity conservation, and addressing shared environmental challenges OSPAR Commission's coordination efforts: The OSPAR network fosters international cooperation for the conservation of the North-East Atlantic through regional assessments, joint monitoring programs, and policy formulation to address transboundary environmental challenges. Barcelona Convention's institutional coordination framework: The convention's compliance mechanisms and reporting systems provide valuable insights into how inter-jurisdictional cooperation can be structured to promote biodiversity conservation across multiple national boundaries. Stakeholder engagement platforms: The Barcelona Convention has established a working group to support an ecosystem-based approach in MSP, fostering collaboration between different authorities and ensuring biodiversity integration across the Mediterranean region.

Edit online (for developers only)

CHAPTER

TEN

CRITERIA CLASSES

10.1 1 Ecological and genetic criteria

10.1.1 Ecological and genetic criteria

Narrower "Criteria class"

- *Functional*
- *Structural*
- *Genetic*
- *Ecological status*

Description

Criteria that relate to living organisms, habitats and ecosystems, and their genetic structure

Source MSP4BIO D2.2

Edit online (for developers only)

10.1.2 Functional

Broader "Criteria class"

- *Ecological and genetic criteria*

Narrower "Criteria class"

- *Vulnerability*
- *Stability*
- *Functional hotspots*
- *Life cycle critical areas*
- *Climate-smart potential*

Description

Criteria that refer to processes and properties of ecosystems and their components, that relate to functioning, from ecosystem level to species level

Edit online (for developers only)

10.1.3 Vulnerability

Broader "Criteria class"

- *Functional*

Related criteria

- *Traits-based Adaptivity*
- *Sensitivity*
- *Resilience/Recovery*
- *Resistance*
- *Species Vulnerability to Climatic and Anthropogenic stressors*

Description

Definition: this macro-criterion reflects the ability of communities to fill diverse niches, assimilate energy (productivity), transfer it within and across ecosystems, and enhance and stabilize ecosystem processes (functioning). Inner stability criteria are redundancy (e.g., the same function provided by several species with different levels of vulnerability), ecosystem integrity and adaptivity (e.g., the higher the level of functional diversity, the higher the probability of a system to adapt to new conditions). Therefore, this macro-criterion is mainly supported by functional diversity matrices (for an extended definition see paragraph 3.2.2 in D3.2). Connectivity is also essential to maintain stability, persistence, and adaptation (paragraph 3.2.4 in D3.2).

Example of criteria use: 1. Identifying priority areas where to improve conservation in relation to climatic and non-climatic threats; 2. Optimizing site selection and spatial conservation strategies by providing scenarios (including functional diversity other than species diversity as a benchmark for definition of diversity hotspot) and optimization of sites (or habitats) selection for protection; 3. Evaluating timing for which the management measures implemented in the area will be efficient.

Source Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

Foden, W.B., Young, B.E., Akçakaya, H.R., Garcia, R.A., Hoffmann, A.A., Stein, B.A., Thomas, C.D., Wheatley, C.J., Bickford, D., Carr, J.A., Hole, D.G., Martin, T.G., Pacifici, M., Pearce-Higgins, J.W., Platts, P.J., Visconti, P., Watson, J.E.M., Huntley, B., 2019. Climate change vulnerability assessment of species. WIREs Climate Change 10, e551. https://doi.org/10.1002/wcc.551

Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

10.1.4 Stability

Broader "Criteria class"

- *Functional*

Related criteria

- *Ecosystem Integrity*
- *General Adaptivity*
- *Stability*
- *Redundancy*

Description

Definition: this macro-criterion reflects the ability of communities to fill diverse niches, assimilate energy (productivity), transfer it within and across ecosystems, and enhance and stabilize ecosystem processes (functioning). Inner stability criteria are redundancy (e.g., the same function provided by several species with different levels of vulnerability), ecosystem integrity and adaptivity (e.g., the higher the level of functional diversity, the higher the probability of a system to adapt to new conditions). Therefore, this macro-criterion is mainly supported by functional diversity matrices (for an extended definition see paragraph 3.2.2 in D3.2). Connectivity is also essential to maintain stability, persistence, and adaptation (paragraph 3.2.4 in D3.2).

Example of criteria use: 1. Identifying priority areas where to improve conservation in relation to climatic and non-climatic threats; 2. Optimizing site selection and spatial conservation strategies by providing scenarios (including functional diversity other than species diversity as a benchmark for definition of diversity hotspot) and optimization of sites (or habitats) selection for protection; 3. Evaluating timing for which the management measures implemented in the area will be efficient.

Source Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

10.1.5 Functional hotspots

Broader "Criteria class"

- *Functional*

Related criteria

- *Functional hotspots*
- *Key functional areas*
- *Presence of key functional species*
- *Food web structure*
- *Functionally representative areas*

Description

Hotspots of ecosystem functioning and functional diversity (i.e., functional hotspots);

Edit online (for developers only)

10.1.6 Life cycle critical areas

Broader "Criteria class"

- *Functional*

Related criteria

- *Developmental and feeding/foraging habitats/areas*
- *Recruitment areas*
- *Nursery and breeding grounds*
- *Larval sources and spawning aggregation areas*
- *Refuge areas*
- *Steppingstone areas*
- *Ecological corridors/migration routes*
- *Life cycle critical areas*

Description

Areas important for the completion of life cycles: nursery, feeding, spawning, breeding, ecological corridors-connectivity among areas, etc. (i.e., life cycle critical areas)

Edit online (for developers only)

10.1.7 Climate-smart potential

Broader "Criteria class"

- *Functional*

Related criteria

- *Concentrative Potential of Species of interest*
- *Potential for mitigation*
- *Climate-smart potential*
- *Potential for Adaptation*
- *Connectivity Potential*
- *Climatic stability*

Description

Areas/communities/species with climate change adaptive, mitigation, resilience potential (i.e., climate-smart potential).

Definition: This macro-criterion focuses on identifying areas and species that offer significant climate benefits, such as contributing to climate mitigation protection and restoration, enhancing ecosystem and community resilience, and facilitating adaptation to climate change. The assessment of climate-smart potential is based on evaluating biodiversity vulnerability to current and future climate change impacts, alongside the analysis of climate velocities. This macro-criterion is supported by several specific criteria outlined in section 5.1.1 of D3.3, including the "Concentrative Potential of Species of Climatic Interest" (which, although largely theoretical, has been empirically demonstrated in some species for their recovery/resilience or adaptability to climate change), "Potential for Mitigation" (for example, through carbon sequestration and acidity buffering, as discussed by Jacquemont et al., 2022), "Potential for Adaptation", "Connectivity Potential", and "Climatic Stability" (which encompasses both dynamic stability and climate-refugia).

Example of applications: 1. Identifying of climate-smart areas and or key species; 2. Evaluating of mitigation and adaptation potential inside a management entity; 3. Evaluating of the potential future productivity of areas of interest under climate change and climate change incidence on local communities (e.g., in the context of fisheries planning); 4. Evaluating local risks (e.g., food supply); 5. Informing the design of MPAs and MPA networks (D3.3, section 6).

Source Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

10.1.8 Structural

Broader "Criteria class"

- *Ecological and genetic criteria*

Description

Criteria that refer to the structure of ecosystems, habitats and species (e.g. which species are there and how many, how complex is the habitat)

Edit online (for developers only)

10.1.9 Genetic

Broader "Criteria class"

- *Ecological and genetic criteria*

Description

Criteria related to the genetic structure of organisms

Edit online (for developers only)

10.1.10 Ecological status

Broader "Criteria class"

- *Ecological and genetic criteria*

Description

Criteria related to the condition/state of ecological features and the environment, including references to IUCN Red List Categories (e.g. near threatened, endangered), references to ecological status or to the degree of conservation, references to naturalness and the degree of disturbance of a particular ecological feature

Edit online (for developers only)

10.2 5 Socio–economic & governance criteria

10.2.1 Socio–economic & governance criteria

Narrower "Criteria class"

- *Socio–economic criteria*
- *Governance criteria*

Source Pegorelli C., García-Sanabria J., de Andres M., García-Onetti J., Luengo S. R., (2023) Criteria for the representation of the social and economic dimension of MPAs (Deliverable – D4.1., under the WP4 of MSP4BIO project (GA n° 101060707)).

Edit online (for developers only)

10.2.2 Socio–economic criteria

Broader "Criteria class"

- *Socio–economic & governance criteria*

Narrower "Criteria class"

- *Blue Economy*
- *Culture*
- *Human wellbeing*
- *Education and science*

Related criteria

- *Area important because it allows access to relevant areas for the marine users.*
- *Area important for locally-caught seafood*
- *Area important for the generation of employment and income linked to non traditional activities*
- *Area important for fishery activity*
- *Area important for dredging*
- *Area important because of the presence of structure with significant historical and cultural. (mo*

- *Area of high scientific interest*
- *Area important for educational interest*
- *Area important because of the occurrence of iconic species/habitats for the local community*
- *Area important for thehealth of coastal residents and/or resource users (mental health, physical hea*
- *Area important due to the socio-cultural dependence of the coastal community with its environ*
- *Area important to be managed due to the presence ofspatial conflicts among users*
- *Area important because of the presence of cultural symbolic value*
- *Area important for recreation and leisure*
- *Area important because of the presence of cultural and tradition activities that support local fo*
- *Area important for traditional human settlement, land-use, or sea-use which is representative of*
- *Area with high scenic and/or aesthetic value*
- *Area important for shipping*
- *Area is important for the development of blue economy activities*
- *Area with current/potential importance to explore and demonstrate approaches and management solution*

Description

This Criterium is related to the following policies and technical reports: WWF (2021); Ehler (2014); IMO PSSAs; SPAMI List

Source Pegorelli C., García-Sanabria J., de Andres M., García-Onetti J., Luengo S. R., (2023) Criteria for the representation of the social and economic dimension of MPAs (Deliverable – D4.1., under the WP4 of MSP4BIO project (GA n° 101060707)).

Edit online (for developers only)

10.2.3 Blue Economy

Broader "Criteria class"

- *Socio–economic criteria*

Edit online (for developers only)

10.2.4 Culture

Broader "Criteria class"

- *Socio–economic criteria*

Edit online (for developers only)

10.2.5 Human wellbeing

Broader "Criteria class"

- *Socio–economic criteria*

Edit online (for developers only)

10.2.6 Education and science

Broader "Criteria class"

- *Socio–economic criteria*

Edit online (for developers only)

10.2.7 Governance criteria

Broader "Criteria class"

- *Socio–economic & governance criteria*

Narrower "Criteria class"

- *Strategic management*
- *Planning*
- *Information, knowledge and evaluation*

Related criteria

- *Equity*
- *Clear strategic plan for the development of sustainable blue economy*
- *Cross-border cooperation*
- *Decision making is based on best information and knowledge available*
- *Strategic Environmental Assessment*
- *Monitoring and evaluation*
- *Instruments to ensure and guide development and implementation of marine policies*
- *Sustainable fishing management*
- *Climate change measures established*
- *Ecosystem based management approach*
- *Long term strategic adaptive management*
- *Coherence management of the area*
- *Stakeholder participation*

Source Pegorelli C., García-Sanabria J., de Andres M., García-Onetti J., Luengo S. R., (2023) Criteria for the representation of the social and economic dimension of MPAs (Deliverable – D4.1., under the WP4 of MSP4BIO project (GA n° 101060707)).

Edit online (for developers only)

10.2.8 Strategic management

Broader "Criteria class"

- *Governance criteria*

Edit online (for developers only)

10.2.9 Planning

Broader "Criteria class"

- *Governance criteria*

Edit online (for developers only)

10.2.10 Information, knowledge and evaluation

Broader "Criteria class"

- *Governance criteria*

Edit online (for developers only)

CHAPTER

ELEVEN

CRITERIA

11.1 1.1.1 Vulnerability

11.1.1 Traits-based Adaptivity

Broader "Criteria class"

- *Vulnerability*

Description

Definition: Adaptivity is the capacity to adjust in response to actual or expected climatic stimuli and their effects. It refers to changes in inner processes, practices and structures to moderate potential damage or to benefit from opportunities associated with climate change (United Nations Framework Convention on Climate Change (UNFCCC), 2023) and anthropogenic pressures. In the vulnerability assessment, adaptivity is traits-based assessed and is subtracted from the sensitivity to obtain a vulnerability score used as proxy to assess the potential response to an individual under a set of stressors.

Example of criteria use: Vulnerability assessment

Source Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

United Nations Framework Convention on Climate Change (UNFCCC), 2023. Adaptation and Resilience [WWW Document]. URL https://unfccc.int/topics/adaptation-and-resilience/the-big-picture/introduction (accessed 11.27.23).

Edit online (for developers only)

11.1.2 Sensitivity

Broader "Criteria class"

- *Vulnerability*

Description

Definition (from D3.3): The degree to which a species is influenced by one or more aspects of climate (Dawson et al., 2011) or anthropogenic stressors. The sensitivity is directly related to the species' inner traits.

Example of criteria use: definition of fragile and sensitive habitats and/or species of concern for conservation, at risk of extinction or sensitive to climate and non-climatic pressures (i.e. in Vulnerability assessments)

WARNING: Sensitivity is the main criteria to be taken into account in Vulnerability analysis and so could be found interchangeably with the term "Vulnerable" in the litterature. Be carefull in terms use.

Notes Key Words: Sensitivity, Risk Assessment, Vulnerability, Climate Change, Anthropogenic stressors, Traits

Source Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

11.1.3 Resilience/Recovery

Broader "Criteria class"

- *Vulnerability*

Description

Definition: ability of a receptor to recover from disturbance or stress (Holling, 1973).

Example of criteria use: Vulnerability assessment, definition of scenario and strategies of resilience

Source Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

Holling, C.S., 1973. Resilience and Stability of Ecological Systems. Annual Review of Ecology and Systematics 4, 1–23. https://www.jstor.org/stable/2096802

Edit online (for developers only)

11.1.4 Resistance

Broader "Criteria class"

- *Vulnerability*

Description

Definition: the capacity of an organism to absorb disturbance or stress without changing character (Holling, 1973).

Example of criteria use: Vulnerability assessment

Source Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

Holling, C.S., 1973. Resilience and Stability of Ecological Systems. Annual Review of Ecology and Systematics 4, 1–23. https://www.jstor.org/stable/2096802

Edit online (for developers only)

11.1.5 Species Vulnerability to Climatic and Anthropogenic stressors

Broader "Criteria class"

- *Vulnerability*

Description

Definition: the degree to which a system is susceptible to, and unable to cope with, the adverse effect of Climate change (IPCC, 2007) or anthropogenic stressors. Vulnerability assessment is a function of the character, magnitude and rate of pressure to which the system is exposed, its sensitivity and its adaptive capacity (IPCC, 2007; Foden et al., 2019).

Example of criteria use: 1. Set conservation priority (i.e., assessing and predicting the vulnerability of species and communities to human-made impacts and climate change), as well as forecasting species extinction risks and evaluating community velocities (i.e., future projection of species distribution); 2. Design more defined boundary for protection, design cross-boundary MPAs when stressors are dispersed; 3. Identify stable, climate-smart potential (areas that promote mitigation and adaptation under climate change) or highly vulnerable areas; 4. Monitor the effectiveness of area-based management tools and to develop scenarios for their adaptive management, e.g., reserve effect or measuring fishery-induced trophic cascades due to overfishing (see D3.2); 5. Create monitoring programme of MPAs measuring climate incidence, species and areas resilience and adaptivity (involves the ongoing assessment of the biological traits of species over time to effectively trace the impacts of management interventions).

Used especially in Risk assessment phase.

Source Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

Foden, W.B., Young, B.E., Akçakaya, H.R., Garcia, R.A., Hoffmann, A.A., Stein, B.A., Thomas, C.D., Wheatley, C.J., Bickford, D., Carr, J.A., Hole, D.G., Martin, T.G., Pacifici, M., Pearce-Higgins, J.W., Platts, P.J., Visconti, P., Watson, J.E.M., Huntley, B., 2019. Climate change vulnerability assessment of species. WIREs Climate Change 10, e551. https://doi.org/10.1002/wcc.551

Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

11.2 1.1.2 Stability

11.2.1 Ecosystem Integrity

Broader "Criteria class"

- *Stability*

Description

Definition: intactness of ecosystems and associated ecological processes, as measured by indicators that capture a) the extent, quality and function of ecosystem components (including biotic and abiotic factors), and/or b) anthropogenic pressures as a proxy for ecosystem degradation and loss.

Synonym: Ecosystem Intactness, include Health status

Example of use: identification of critical reservoirs for the biotiversity and key ecosystems to sustain ecosystems' functions and services maintenance.

Source Ecosystem Integrity in the Post-2020 Global Biodiversity Framework Wildlife Conservation Society (WCS), 2019

Edit online (for developers only)

11.2.2 General Adaptivity

Broader "Criteria class"

- *Stability*

Description

Definition: Adaptivity is the capacity of a system to adjust in response to actual or expected anthropogenic and climatic stimuli and their effects. It refers to changes in inner processes, practices and structures to moderate potential damage or to benefit from opportunities associated with climate change and anthropogenic pressures. In the stability process, adaptivity is not individually based but encompass a broader scale at a species, community or environment scale.

Example: appearance of new behaviours under high fishing pressure

Source Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

11.2.3 Stability

Broader "Criteria class"

- *Stability*

Description

Definition: this macro-criterion reflects the ability of communities to fill diverse niches, assimilate energy (productivity), transfer it within and across ecosystems, and enhance and stabilize ecosystem processes (functioning). Inner stability criteria are redundancy (e.g., the same function provided by several species with different levels of vulnerability), ecosystem integrity and adaptivity (e.g., the higher the level of functional diversity, the higher the probability of a system to adapt to new conditions). Therefore, this macro-criterion is mainly supported by functional diversity matrices (for an extended definition see paragraph 3.2.2 in D3.2). Connectivity is also essential to maintain stability, persistence, and adaptation (paragraph 3.2.4 in D3.2).

Example of criteria use: 1. Identifying priority areas where to improve conservation in relation to climatic and non-climatic threats; 2. Optimizing site selection and spatial conservation strategies by providing scenarios (including functional diversity other than species diversity as a benchmark for definition of diversity hotspot) and optimization of sites (or habitats) selection for protection; 3. Evaluating timing for which the management measures implemented in the area will be efficient.

Source Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

11.2.4 Redundancy

Broader "Criteria class"

- *Stability*

Description

Definition: repetition of same function, trophic level or habitat type inside the same entity at different scales (MPA, MPA network, MSP…). Redundancy is used as proxies of insurance (i.e., when one species is able to replace a similar species from the same functional niche) and to maximise the probability of succes under uncertainty, taken into account that different species will react differently under the same stressor. Functional redundancy can be measured by binning multiple species traits with the Sturges algorithm (i.e., data were divided into classes based on the sample size and distribution of values across each trait).

Example of use: design of MPA network to increase chance of success of protection.

Source Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

11.3 1.1.3 Functional hotspots

11.3.1 Food web structure

Broader "Criteria class"

- *Functional hotspots*

Description

Characterised by complexity, length and interactions (D3.4)

Edit online (for developers only)

11.3.2 Presence of key functional species

Broader "Criteria class"

- *Functional hotspots*

Description

e.g. apex predators, primary producers or other specific trophic group, functionally rare species, (Grenié et al., 2018 cited in D3.4)

Edit online (for developers only)

11.3.3 Key functional areas

Broader "Criteria class"

- *Functional hotspots*

Description

e.g. Carbon sink and source areas (D3.4)

Edit online (for developers only)

11.3.4 Functionally representative areas

Broader "Criteria class"

- *Functional hotspots*

Description

Areas with many critical/key functions (D3.4)

Edit online (for developers only)

11.3.5 Functional hotspots

Broader "Criteria class"

- *Functional hotspots*

Description

Functional hotspots: This macro-criterion refers to areas that are important for the provision of a discrete ecological function (e.g., Carbon storage, photosynthetic production) or areas where key ecological functions are concentrated (e.g., productivity). Internal criteria for functional hotspots are the presence of key functional species (e.g., apex predators, primary producers or other specific trophic group, functionally rare species, Grenié et al., 2018), key functional areas (e.g., Carbon sink and source areas), functionally representative areas (areas with many critical/key functions) and food web structure (complexity, length, interactions). The strategy for addressing functional hotspots is mainly based on functional diversity and trophic ecology approaches and metrics (D3.4).

Edit online (for developers only)

11.4 1.1.4. Life cycle critical areas

11.4.1 Developmental and feeding/foraging habitats/areas

Broader "Criteria class"

- *Life cycle critical areas*

Description

Areas/habitats important for the developmental life stages of a species and/or for the provision of food/prey.

From Meylan et al. (2011) in the context of sea turtle ecology and migrations :

"Archie Carr (1956) brought many important ideas to the study of sea turtle biology, including the concept of "developmental habitat."

This term has frequently been applied to the portion of the lifecycle between the epipelagic stage that follows hatching (the lost year or lost years, or oceanic phase of Bolten, 2003) and the occupation of an adult foraging range. The idea of a separate, immature-dominated, benthic life history stage originates from the work of Carr and Caldwell (1956) on green turtles (Chelonia mydas) at Cedar Key, Florida.

In that study, the authors concluded, "Florida green turtles come in on this current [the Loop Current], perhaps growing to the approximately 10-pound minimum size for Florida specimens on the way, and then exploit the local feeding resources, attain a size and strength that would permit a return to tropical waters by some other route."

Edit online (for developers only)

11.4.2 Life cycle critical areas

Broader "Criteria class"

- *Life cycle critical areas*

Description

Areas important for the completion of life cycles: nursery, feeding, spawning, breeding, ecological corridors-connectivity among areas, etc.

Life cycle critical areas: This macro-criterion corresponds to the need for organisms to move between vital (critical) areas in order to fulfil their vital functions and complete their life cycle. It therefore refers to areas important for the completion of the life cycle of organisms (nursery, feeding, spawning, breeding) and the ecological corridors - links between these areas, etc. Criteria within this macro-criterion include ecological corridors/migration routes, steppingstone areas, refuge areas, larval sources and spawning aggregation areas, nursery and breeding areas, recruitment areas (larval sinks), development and feeding/foraging habitats/areas. A possible methodological strategy to address this macro-criterion is the modelling of species and habitat distributions and ecological connectivity (D3.4).

Edit online (for developers only)

11.4.3 Refuge areas

Broader "Criteria class"

- *Life cycle critical areas*

Description

"Refuges are habitat features that provide individuals or populations buffering or protection against environmental, biotic or anthropogenic stressors" (Bongaerts & Smith, 2019; Keppel et al., 2012; Pavey et al., 2015 cited in Boon et al. 2023).

Edit online (for developers only)

11.4.4 Steppingstone areas

Broader "Criteria class"

- *Life cycle critical areas*

Description

Ecologically suitable patch (typically small in size) that may act to connect larger patches of habitat. Stepping stones may function at two different time scales.

First, at the shortest time scale, they may provide a temporary stopping location for an organism moving through the landscape/seascape.

Second, at the longer time scale, they may provide a breeding location so that an organism and/or its offspring can move to more distant patches (Adapted from de la Peña-Domene and Minor, 2014, DOI: 10.1081/E-ENRL-120047451).

Edit online (for developers only)

11.4.5 Ecological corridors/migration routes

Broader "Criteria class"

- *Life cycle critical areas*

Edit online (for developers only)

11.4.6 Recruitment areas

Broader "Criteria class"

- *Life cycle critical areas*

Description

E.g. Larval sink areas.

"For open marine populations, recruitment is generally defined as the addition of individuals to local populations following settlement from the pelagic larval phase to the benthic or demersal early juvenile phase."

(Caley et al., 1996, Recruitment and the Local Dynamics of Open Marine Populations, https://doi.org/10.1146/annurev.ecolsys.27.1.477)

Edit online (for developers only)

11.4.7 Nursery and breeding grounds

Broader "Criteria class"

- *Life cycle critical areas*

Description

A marine nursery (area/site/ground) is defined as a juvenile habitat for a particular species that contributes a greater than average number of individuals to the adult population on a per-unit-area basis, as compared to other habitats used by juveniles (Dahlgren et al., 2006, doi:10.3354/meps312291)

Breeding ground: A place where animals breed or to which they return to breed

Edit online (for developers only)

11.4.8 Larval sources and spawning aggregation areas

Broader "Criteria class"

- *Life cycle critical areas*

Description

An area where an organism releases larvae/releases or deposits eggs (e.g. a fish depositing eggs in a place for fertilisation)

Edit online (for developers only)

11.5 1.1.5 Climate-smart potential

11.5.1 Concentrative Potential of Species of interest

Broader "Criteria class"

- *Climate-smart potential*

Description

Definition: Areas concentrative of species define as of interest in the framework of analysis (list define in the scoping phase). This list of species depends of the scope under which the analysis is performed, but also of the chosen projection "pathway" (e.g. resilience, mitigation according to societal priorities).

Examples of application: - prioritize areas including species from the IUCN Red List for Conservative Pathway - priotitize areas concentrative of apex predators, teleost fish and long-lived animals for Mitigation pathway (high uncertainty)

Source Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

11.5.2 Potential for mitigation

Broader "Criteria class"

- *Climate-smart potential*

Description

Definition: species or areas making "the impacts of climate change less severe by preventing or reducing the emission of greenhouse gases (GHG) into the atmosphere." and could be achieved by "reducing the sources of these gases or by enhancing their storage" (European Environment Agency, 2023). This includes key habitats (e.g. mangroves, sediments bottom) (e.g. Jacquemont et al., 2022; Pessarrodona et al., 2023) and species (e.g., teleost fish). This areas or species are of prior importance for the Mitigation Pathway (D3.3, section 5.2.2.3)

Source Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

Jacquemont et al (2022) Ocean conservation boosts climate change mitigation and adaptation. One Earth. (https://doi.org/10.1016/j.oneear.2022.09.002)

Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

11.5.3 Climate-smart potential

Broader "Criteria class"

- *Climate-smart potential*

Description

Areas/communities/species with climate change adaptive, mitigation, resilience potential (i.e., climate-smart potential).

Definition: This macro-criterion focuses on identifying areas and species that offer significant climate benefits, such as contributing to climate mitigation protection and restoration, enhancing ecosystem and community resilience, and facilitating adaptation to climate change. The assessment of climate-smart potential is based on evaluating biodiversity vulnerability to current and future climate change impacts, alongside the analysis of climate velocities. This macro-criterion is supported by several specific criteria outlined in section 5.1.1 of D3.3, including the "Concentrative Potential of Species of Climatic Interest" (which, although largely theoretical, has been empirically demonstrated in some species for their recovery/resilience or adaptability to climate change), "Potential for Mitigation" (for example, through carbon sequestration and acidity buffering, as discussed by Jacquemont et al., 2022), "Potential for Adaptation", "Connectivity Potential", and "Climatic Stability" (which encompasses both dynamic stability and climate-refugia).

Example of applications: 1. Identifying of climate-smart areas and or key species; 2. Evaluating of mitigation and adaptation potential inside a management entity; 3. Evaluating of the potential future productivity of areas of interest under climate change and climate change incidence on local communities (e.g., in the context of fisheries planning); 4. Evaluating local risks (e.g., food supply); 5. Informing the design of MPAs and MPA networks (D3.3, section 6).

Source Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

11.5.4 Potential for Adaptation

Broader "Criteria class"

- *Climate-smart potential*

Description

Definition: species or areas concentrating adaptive or desirable traits under climate change are concentrated. These areas/species should theoretically suffer from a moderate influence of climate change as some studies suggest that a diffuse or punctual influence of climate change could promote the development and the spread inside the population of the desirable traits (Kelly and Griffiths, 2021) on the same principle as vaccination or spill-over or present higher generation rate.

Example of use: Identifying areas that could promote adaptivity inside a MPA network

Source Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

11.5.5 Connectivity Potential

Broader "Criteria class"

- *Climate-smart potential*

Description

Definition: areas or mobile/productive species that will enhance resistance under climate change of other adjacent areas, facilitate range shifts (e.g. stepping stone areas) or participate to the spread of desirable traits inside a network.

Example of uses: designation of a climate-smart MPA network, assessing the potential resilience of a species

Source Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

11.5.6 Climatic stability

Broader "Criteria class"

- *Climate-smart potential*

Description

Definition: include dynamic stability (capacity of a system, populations or areas, to maintain under climate change) and climate refugia.

Example of interest: Identifying the future hotspot of biodiversity, identifying the future functional areas

Source Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

11.6 5.1 Socio–economic criteria

11.6.1 Area important because it allows access to relevant areas for the marine users.

Broader "Criteria class"

- *Socio–economic criteria*

Description

The marine area is a space to access another relevant area. For example, a maritime space that gives access to a fishing ground.

Source Authors expert criteria

Edit online (for developers only)

11.6.2 Area important for locally-caught seafood

Broader "Criteria class"

- *Socio–economic criteria*

Description

The specific activity of shell fishing occurs in that place or has great potential for it to take place there.

Source Ehler, C. (2014) A Guide to Evaluating Marine Spatial Plans. Paris, UNESCO. IOC Manuals and Guides, 70; ICAM Dossier 8. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000227779/PDF/227779eng.pdf.multi

IMO PSSAs

Edit online (for developers only)

11.6.3 Area important for the generation of employment and income linked to non traditional activities

Broader "Criteria class"

- *Socio–economic criteria*

Description

The area is (or can be) an important source of income and industrial jobs at industrial scale.< activities

Source WWF (2022) Assessing the balance between nature and people in European Seas: Maritime Spatial Planning in the North-East Atlantic Ocean. WWF European Policy Office, WWF-Portugal, WWF-Spain. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_east_atlantic_msp_assessment_2022.pdf

WWF European Policy Office (2022a) Maritime Spatial Planning in the North-East Atlantic – Technical Annex. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_east_atlantic_msp_assessment_2022___technical_annex.pdf

WWF European Policy Office (2022b) Maritime Spatial Planning in the North Sea – Technical Annex. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_sea_msp_assessment_2022___technical_annex.pdf

Edit online (for developers only)

11.6.4 Area important for fishery activity

Broader "Criteria class"

- *Socio–economic criteria*

Description

The area is important for fishing, which occurs in that place or has the potential for it to occur. The area could also be important to the sector because it presents characteristics and conditions that sustain the fishery in another location. Eg: because it is a breeding and spawning zone.

Source WWF (2022); WWF European Policy Office (2022a); WWF European Policy Office (2022b); MSFD Annex III Table 1; IMO PSSAs; DEVOTES indicators

Edit online (for developers only)

11.6.5 Area important for dredging

Broader "Criteria class"

- *Socio–economic criteria*

Description

It is a place of interest (current or future) for activities related to dredging, both the extraction of sand (to increase the depth, for example) or the deposition of this dredged material.

Source Ehler, C. (2014) A Guide to Evaluating Marine Spatial Plans. Paris, UNESCO. IOC Manuals and Guides, 70; ICAM Dossier 8. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000227779/PDF/227779eng.pdf.multi

SPAMI List - : RAC/SPA. (2020). Protocol concerning specially protected areas and biological diversity in the Mediterranean, Annex I: Common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI list. https://www.rac-spa.org/sites/default/files/annex/annex_1_en.pdf

DEVOTES indicators

Edit online (for developers only)

11.6.6 Area important because of the presence of structure with significant historical and cultural. (mo

Broader "Criteria class"

- *Socio–economic criteria*

Description

The area is of relevance for its tangible cultural heritage. There are relevant historical or archaeological sites, as well as coastal and marine constructions or notable monuments for the local culture.

Source IMO PSSAs;

UNESCO-IOC/European Commission (2021) MSPglobal International Guide on Marine/Maritime Spatial Planning. Paris, UNESCO. (IOC Manuals and Guides no 89). Available at: https://unesdoc.unesco.org/ark:/48223/pf0000379196

WWF (2021) Guidance Paper – Ecosystem-based Maritime Spatial Planning in Europe and how to assess it. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_eb_maritime_spatial_planning_guidance_paper_march_2021.pdf.

Edit online (for developers only)

11.6.7 Area of high scientific interest

Broader "Criteria class"

- *Socio–economic criteria*

Description

Area considered of interest to the scientific community, because research is carried out or can be carried out.

Source WWF (2021) Guidance Paper – Ecosystem-based Maritime Spatial Planning in Europe and how to assess it. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_eb_maritime_spatial_planning_guidance_paper_march_2021.pdf.

Ehler, C. (2014) A Guide to Evaluating Marine Spatial Plans. Paris, UNESCO. IOC Manuals and Guides, 70; ICAM Dossier 8. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000227779/PDF/227779eng.pdf.multi

IMO PSSAs; SPAMI List - RAC/SPA. (2020). Protocol concerning specially protected areas and biological diversity in the Mediterranean, Annex I: Common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI list.

Edit online (for developers only)

11.6.8 Area important for educational interest

Broader "Criteria class"

- *Socio–economic criteria*

Description

It is an area in which environmental education activities are developed or can be developed, due to its natural characteristics.

Source IMO PSSAs; SPAMI List - RAC/SPA. (2020). Protocol concerning specially protected areas and biological diversity in the Mediterranean, Annex I: Common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI list.

Edit online (for developers only)

11.6.9 Area important because of the occurrence of iconic species/habitats for the local community

Broader "Criteria class"

- *Socio–economic criteria*

Description

It is an area with iconic coastal or marine species (seals, whales, an emblematic shorebird, etc.), or habitats highlighted by the local population (for example, a natural monument).

Source WWF (2022) Assessing the balance between nature and people in European Seas: Maritime Spatial Planning in the North-East Atlantic Ocean. WWF European Policy Office, WWF-Portugal, WWF-Spain. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_east_atlantic_msp_assessment_2022.pdf

WWF European Policy Office (2022a) Maritime Spatial Planning in the North-East Atlantic – Technical Annex. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_east_atlantic_msp_assessment_2022___technical_annex.pdf

WWF European Policy Office (2022b) Maritime Spatial Planning in the North Sea – Technical Annex. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_sea_msp_assessment_2022___technical_annex.pdf

IMO PSSAs;

ACCOBAMS-ECS-WK. (2017). Inputs to the ACCOBAMS ongoing effort to map human threats on cetaceans in the Mediterranean and Black Seas. ThreatReport, 31st ECS Conference (30th April 2017, Middelfart, Denmark).

SPAMI List - RAC/SPA. (2020). Protocol concerning specially protected areas and biological diversity in the Mediterranean, Annex I: Common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI list. https://www.rac-spa.org/sites/default/files/annex/annex_1_en.pdf

MSFD Annex III Table 1 - MSFD - Directive 2008/56/EC. (2008). Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).

Edit online (for developers only)

11.6.10 Area important for thehealth of coastal residents and/or resource users (mental health, physical hea

Broader "Criteria class"

- *Socio–economic criteria*

Description

It is an important area for the well-being of the population that has an impact on their own health (mental health, physical health, etc…), either for the enjoyment of the area or its natural resources.

Source Ehler, C. (2014) A Guide to Evaluating Marine Spatial Plans. Paris, UNESCO. IOC Manuals and Guides, 70; ICAM Dossier 8. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000227779/PDF/227779eng.pdf.multi

Edit online (for developers only)

11.6.11 Area important due to the socio-cultural dependence of the coastal community with its environ

Broader "Criteria class"

- *Socio–economic criteria*

Description

The use of living coastal and marine resources and their relationship with environmental quality is of particular importance regarding social, cultural, or local economic issues like fishing, recreation, tourism, and people's way of life and subsistence.

Source IMO PSSAs

Edit online (for developers only)

11.6.12 Area important to be managed due to the presence ofspatial conflicts among users

Broader "Criteria class"

- *Socio–economic criteria*

Description

It is an area in which there are several current or potential uses and economic activities among which there may be conflicts of use for the same space or resources.

Source WWF (2022) Assessing the balance between nature and people in European Seas: Maritime Spatial Planning in the North-East Atlantic Ocean. WWF European Policy Office, WWF-Portugal, WWF-Spain. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_east_atlantic_msp_assessment_2022.pdf

WWF European Policy Office (2022a) Maritime Spatial Planning in the North-East Atlantic – Technical Annex. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_east_atlantic_msp_assessment_2022___technical_annex.pdf

WWF European Policy Office (2022b) Maritime Spatial Planning in the North Sea – Technical Annex. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_sea_msp_assessment_2022___technical_annex.pdf

wwf_eb_maritime_spatial_planning_guidance_paper_march_2021: WWF (2021) Guidance Paper – Ecosystem-based Maritime Spatial Planning in Europe and how to assess it. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_eb_maritime_spatial_planning_guidance_paper_march_2021.pdf.

Edit online (for developers only)

11.6.13 Area important because of the presence of cultural symbolic value

Broader "Criteria class"

- *Socio–economic criteria*

Description

The area has a high value with respect to intangible cultural heritage, due to the existence of traditional activities or a culture that gives an ethnological value to the area

Source WWF (2021) Guidance Paper – Ecosystem-based Maritime Spatial Planning in Europe and how to assess it. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_eb_maritime_spatial_planning_guidance_paper_march_2021.pdf.

Ehler, C. (2014) A Guide to Evaluating Marine Spatial Plans. Paris, UNESCO. IOC Manuals and Guides, 70; ICAM Dossier 8. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000227779/PDF/227779eng.pdf.multi

UNESCO-IOC/European Commission (2021) MSPglobal International Guide on Marine/Maritime Spatial Planning. Paris, UNESCO. (IOC Manuals and Guides no 89). Available at: https://unesdoc.unesco.org/ark:/48223/pf0000379196

IMO PSSAs;

UNESCO - UNESCO. (2023). WHC.23/01: Operational guidelines for the implementation of the World Heritage Convention. Available at: https://whc.unesco.org/en/guidelines/

UNCLOS identification of areas for protection; - United Nations. (2023). Draft agreement under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction. Intergovernmental conference on an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, resumed fifth session, New York, 20 February–3 March 2023. Available at: https://www.un.org/bbnj/sites/www.un.org.bbnj/files/draft_agreement_advanced_unedited_for_posting_v1.pdf

SPAMI List - RAC/SPA. (2020). Protocol concerning specially protected areas and biological diversity in the Mediterranean, Annex I: Common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI list. https://www.rac-spa.org/sites/default/files/annex/annex_1_en.pdf

Edit online (for developers only)

11.6.14 Area important for recreation and leisure

Broader "Criteria class"

- *Socio–economic criteria*

Description

The area is important for developing activities related to maritime and/or coastal associated with free time, such as sailing, diving, etc.

Source Ehler, C. (2014) A Guide to Evaluating Marine Spatial Plans. Paris, UNESCO. IOC Manuals and Guides, 70; ICAM Dossier 8. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000227779/PDF/227779eng.pdf.multi

IMO PSSAs;

SPAMI List - RAC/SPA. (2020). Protocol concerning specially protected areas and biological diversity in the Mediterranean, Annex I: Common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI list. https://www.rac-spa.org/sites/default/files/annex/annex_1_en.pdf

MSFD Annex III Table 1 - Directive 2008/56/EC. (2008). Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).

Edit online (for developers only)

11.6.15 Area important because of the presence of cultural and tradition activities that support local fo

Broader "Criteria class"

- *Socio–economic criteria*

Description

The area is important due to the presence of activities (usually traditional or low intensity), such as fishing production or shell fishing, it is essential for the community to have a safe flow of food supply for own consumption and access to quality food

Source WWF (2021) Guidance Paper – Ecosystem-based Maritime Spatial Planning in Europe and how to assess it. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_eb_maritime_spatial_planning_guidance_paper_march_2021.pdf.

Ehler, C. (2014) A Guide to Evaluating Marine Spatial Plans. Paris, UNESCO. IOC Manuals and Guides, 70; ICAM Dossier 8. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000227779/PDF/227779eng.pdf.multi

IMO PSSAs

Edit online (for developers only)

11.6.16 Area important for traditional human settlement, land-use, or sea-use which is representative of

Broader "Criteria class"

- *Socio–economic criteria*

Description

Areas that preserve ancestral ways of life (in the use of resources, the activities they carry out, etc.), or settlements that are a sample of ancient cultures that inhabited the area.

Source UNESCO - UNESCO. (2023). WHC.23/01: Operational guidelines for the implementation of the World Heritage Convention. Available at: https://whc.unesco.org/en/guidelines/

IMO PSSAs;

SPAMI List - RAC/SPA. (2020). Protocol concerning specially protected areas and biological diversity in the Mediterranean, Annex I: Common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI list. https://www.rac-spa.org/sites/default/files/annex/annex_1_en.pdf

Edit online (for developers only)

11.6.17 Area with high scenic and/or aesthetic value

Broader "Criteria class"

- *Socio–economic criteria*

Description

It is a place where its landscape or aesthetic attractions stand out, or where the values associated with the area are culturally relevant (includes land-sea landscape, sea-land and submerged landscapes)

Source Ehler, C. (2014) A Guide to Evaluating Marine Spatial Plans. Paris, UNESCO. IOC Manuals and Guides, 70; ICAM Dossier 8. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000227779/PDF/227779eng.pdf.multi

WWF (2021) Guidance Paper – Ecosystem-based Maritime Spatial Planning in Europe and how to assess it. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_eb_maritime_spatial_planning_guidance_paper_march_2021.pdf.

IMO PSSAs;

UNESCO - UNESCO. (2023). WHC.23/01: Operational guidelines for the implementation of the World Heritage Convention. Available at: https://whc.unesco.org/en/guidelines/

SPAMI List - RAC/SPA. (2020). Protocol concerning specially protected areas and biological diversity in the Mediterranean, Annex I: Common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI list. https://www.rac-spa.org/sites/default/files/annex/annex_1_en.pdf

Edit online (for developers only)

11.6.18 Area important for shipping

Broader "Criteria class"

- *Socio–economic criteria*

Description

It is a place of great interest for navigation, for example, because the area has relevant characteristics that facilitate or support it (sufficient depth, legal reserves…), or in an indirect way because the area can support and regulate pressures like noise, discharges, etc

Source MSFD Annex III Table 1 - Directive 2008/56/EC. (2008). Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).

HD Annex III: CRITERIA FOR SELECTING SITES ELIGIBLE FOR IDENTIFICATION AS SITES OF COMMUNITY IMPORTANCE AND DESIGNATION AS SPECIAL AREAS OF CONSERVATION - HD Annex III - Council Directive 92/43/EEC. (1992). Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. related to Annex III;

IMO PSSAs -

ACCOBAMS_CCH - ACCOBAMS-ECS-WK. (2017). Inputs to the ACCOBAMS ongoing effort to map human threats on cetaceans in the Mediterranean and Black Seas. ThreatReport, 31st ECS Conference (30th April 2017, Middelfart, Denmark).

DEVOTES indicators -

Edit online (for developers only)

11.6.19 Area is important for the development of blue economy activities

Broader "Criteria class"

- *Socio–economic criteria*

Description

The area has relevant characteristics that facilitate or support specific activities related to the blue economy (Aquaculture, offshore wind farm, biotechnology, tourism, …)

Source WWF (2021) Guidance Paper – Ecosystem-based Maritime Spatial Planning in Europe and how to assess it. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_eb_maritime_spatial_planning_guidance_paper_march_2021.pdf.

WWF (2022) Assessing the balance between nature and people in European Seas: Maritime Spatial Planning in the North-East Atlantic Ocean. WWF European Policy Office, WWF-Portugal, WWF-Spain. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_east_atlantic_msp_assessment_2022.pdf

WWF European Policy Office (2022a) Maritime Spatial Planning in the North-East Atlantic – Technical Annex. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_east_atlantic_msp_assessment_2022___technical_annex.pdf

WWF European Policy Office (2022b) Maritime Spatial Planning in the North Sea – Technical Annex. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_sea_msp_assessment_2022___technical_annex.pdf

Ehler, C. (2014) A Guide to Evaluating Marine Spatial Plans. Paris, UNESCO. IOC Manuals and Guides, 70; ICAM Dossier 8. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000227779/PDF/227779eng.pdf.multi

EC-CINEA, Burg, S., Chouchane, H., Kraan, M., et al. (2022) Assessment of the relevance and effect of the Maritime Spatial Planning Directive in the context of the European Green Deal: final report. European Commission, European Climate, Infrastructure and Environment Executive Agency, Publications Office of the European Union. Available at: https://data.europa.eu/doi/10.2926/911941

Criteria descriptors MSFD - Directive 2008/56/EC. (2008). Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).

Edit online (for developers only)

11.6.20 Area with current/potential importance to explore and demonstrate approaches and management solution

Broader "Criteria class"

- *Socio–economic criteria*

Description

The area has outstanding natural and/or socio-economic characteristics to be used as pilot area for restoration actions, sustainable development of different activities, compensation mechanisms, green infrastructures, nature-based solutions, etc. And/or the area has a scientific interest.

Source

IMO PSSAs;

SPAMI List - RAC/SPA. (2020). Protocol concerning specially protected areas and biological diversity in the Mediterranean, Annex I: Common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI list. https://www.rac-spa.org/sites/default/files/annex/annex_1_en.pdf

MSFD Annex III Table 1 - Directive 2008/56/EC. (2008). Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).

Edit online (for developers only)

11.7 5.2 Governance criteria

11.7.1 Equity

Broader "Criteria class"

- *Governance criteria*

Description

Clear objectives and social and cultural considerations are defined, adopted, and included in concrete measures. The measures adopted reduce conflicts between users and guarantee an equitable distribution of access to resources and areas, as well as the benefits that are generated.

Source WWF (2021); Ehler (2014); UNESCO-IOC/European Commission (2021)

Edit online (for developers only)

11.7.2 Clear strategic plan for the development of sustainable blue economy

Broader "Criteria class"

- *Governance criteria*

Description

The plan sets out clear economic objectives related to the principles of a sustainable blue economy

Source WWF (2021); Ehler (2014); EC-CINEA et al. (2022)

Edit online (for developers only)

11.7.3 Cross-border cooperation

Broader "Criteria class"

- *Governance criteria*

Description

Mechanisms for cross-border cooperation exist and are used to ensure good planning, monitoring and implementation of transnational issues.

Source WWF (2021); WWF (2022); WWF European Policy Office (2022a); WWF European Policy Office (2022b); EC-CINEA et al. (2022); Black Sea species list criteria

Edit online (for developers only)

11.7.4 Decision making is based on best information and knowledge available

Broader "Criteria class"

- *Governance criteria*

Description

There are quality data and information accessible by the public and by the different administrations and sectors. All information and knowledge (including traditional knowledge) are considered in decision-making process in the area.

Source WWF (2021), UNESCO-IOC/European Commission (2021)

Edit online (for developers only)

11.7.5 Strategic Environmental Assessment

Broader "Criteria class"

- *Governance criteria*

Description

There is an environmental strategic assessement when developing policies or tools to manage the area

Source WWF (2021), UNESCO-IOC/European Commission (2021)

Edit online (for developers only)

11.7.6 Monitoring and evaluation

Broader "Criteria class"

- *Governance criteria*

Description

Monitoring and evaluation of the objectives and management measures of the area are being carried out

Source WWF (2021); Ehler (2014)

Edit online (for developers only)

11.7.7 Instruments to ensure and guide development and implementation of marine policies

Broader "Criteria class"

- *Governance criteria*

Description

The objectives established for the area are developed through instruments (strategies, plans, measures,…), and those have an associated person in charge of their correct implementation.

Source Criteria WNBR Statutory Framework Art.10; WWF (2022); WWF European Policy Office (2022a); WWF European Policy Office (2022b); Ehler (2014); WWF (2021)

Edit online (for developers only)

11.7.8 Sustainable fishing management

Broader "Criteria class"

- *Governance criteria*

Description

Sustainable fishing management is carried out: catches are below biological safety limits, sustainable reproduction is guaranteed, sizes and imposed closures are respected, continuous monitoring is carried out and adaptive management is carried out based on the best available knowledge.

Edit online (for developers only)

11.7.9 Climate change measures established

Broader "Criteria class"

- *Governance criteria*

Description

Measures are established to face the uncertainty scenarios generated by climate change. Mitigation and adaptation measures are included.

Source WWF (2022); WWF European Policy Office (2022a); WWF European Policy Office (2022b); EC-CINEA et al. (2022); Appendix III - Criteria and procedures for designation of SOx emission control areas (Regulation 14)

Edit online (for developers only)

11.7.10 Ecosystem based management approach

Broader "Criteria class"

- *Governance criteria*

Description

Ecosystem services are identified, assessed and incorporated to the management of the area.

Source WWF (2022) Assessing the balance between nature and people in European Seas: Maritime Spatial Planning in the North-East Atlantic Ocean. WWF European Policy Office, WWF-Portugal, WWF-Spain. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_east_atlantic_msp_assessment_2022.pdf

WWF European Policy Office (2022a) Maritime Spatial Planning in the North-East Atlantic – Technical Annex. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_east_atlantic_msp_assessment_2022___technical_annex.pdf

WWF European Policy Office (2022b) Maritime Spatial Planning in the North Sea – Technical Annex. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_sea_msp_assessment_2022___technical_annex.pdf

Ehler, C. (2014) A Guide to Evaluating Marine Spatial Plans. Paris, UNESCO. IOC Manuals and Guides, 70; ICAM Dossier 8. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000227779/PDF/227779eng.pdf.multi

UNESCO-IOC/European Commission (2021) MSPglobal International Guide on Marine/Maritime Spatial Planning. Paris, UNESCO. (IOC Manuals and Guides no 89). Available at: https://unesdoc.unesco.org/ark:/48223/pf0000379196

Ocean's criteria set for selection of essential fish habitats;

SPAMI List; - RAC/SPA. (2020). Protocol concerning specially protected areas and biological diversity in the Mediterranean, Annex I: Common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI list. https://www.rac-spa.org/sites/default/files/annex/annex_1_en.pdf

MSFD Annex III Table 1 - Directive 2008/56/EC. (2008). Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).

Edit online (for developers only)

11.7.11 Long term strategic adaptive management

Broader "Criteria class"

- *Governance criteria*

Description

Long term strategic management is adopted allowing a proactive, iterative and adaptive management. Lessons learned acquired along the different management cycles are being incorporated to management.

Source WWF (2021) Guidance Paper – Ecosystem-based Maritime Spatial Planning in Europe and how to assess it. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_eb_maritime_spatial_planning_guidance_paper_march_2021.pdf.;

UNESCO-IOC/European Commission (2021);

WWF (2022) Assessing the balance between nature and people in European Seas: Maritime Spatial Planning in the North-East Atlantic Ocean. WWF European Policy Office, WWF-Portugal, WWF-Spain. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_east_atlantic_msp_assessment_2022.pdf

WWF European Policy Office (2022a) Maritime Spatial Planning in the North-East Atlantic – Technical Annex. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_east_atlantic_msp_assessment_2022___technical_annex.pdf;

WWF European Policy Office (2022b) Maritime Spatial Planning in the North Sea – Technical Annex. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_sea_msp_assessment_2022___technical_annex.pdf

Bird Life International (2022) Are EU Member State's Maritime Spatial Plans Fit for Nature and Climate? - Technical Report – Approach and Main Findings. Bird Life International Europe and Central Asia. Available at: https://www.birdlife.org/wp-content/uploads/2022/06/Birdlife-Maritime-Spatial-Plan-Technical-report_web.pdf

Edit online (for developers only)

11.7.12 Coherence management of the area

Broader "Criteria class"

- *Governance criteria*

Description

There is coherent coordination of international and sectoral policies and instruments in the area, and also of coastal-marine instruments to manage land-sea interactions. This coordination is articulated through inter-administrative and intra-administrative coordination mechanisms.

Source WWF (2021) Guidance Paper – Ecosystem-based Maritime Spatial Planning in Europe and how to assess it. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_eb_maritime_spatial_planning_guidance_paper_march_2021.pdf.

WWF European Policy Office (2022b) Maritime Spatial Planning in the North Sea – Technical Annex. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_north_sea_msp_assessment_2022___technical_annex.pdf

UNESCO-IOC/European Commission (2021) MSPglobal International Guide on Marine/Maritime Spatial Planning. Paris, UNESCO. (IOC Manuals and Guides no 89). Available at: https://unesdoc.unesco.org/ark:/48223/pf0000379196

SPAMI List - RAC/SPA. (2020). Protocol concerning specially protected areas and biological diversity in the Mediterranean, Annex I: Common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI list. https://www.rac-spa.org/sites/default/files/annex/annex_1_en.pdf

Edit online (for developers only)

11.7.13 Stakeholder participation

Broader "Criteria class"

- *Governance criteria*

Description

There is transparency and documents and information are shared with the interested parties, who participate in the management of the area and are satisfied with the participation process. The results of the participation are being incorporated into the management instruments. Public participation occurs in all management stages from the definition of objectives and the design of instruments to their implementation and evaluation.

Source WWF (2021) Guidance Paper – Ecosystem-based Maritime Spatial Planning in Europe and how to assess it. WWF European Policy Office, Belgium. Available at https://wwfeu.awsassets.panda.org/downloads/wwf_eb_maritime_spatial_planning_guidance_paper_march_2021.pdf.

Ehler (2014); Ehler, C. (2014) A Guide to Evaluating Marine Spatial Plans. Paris, UNESCO. IOC Manuals and Guides, 70; ICAM Dossier 8. Available at: https://unesdoc.unesco.org/ark:/48223/pf0000227779/PDF/227779eng.pdf.multi

UNESCO-IOC/European Commission (2021); UNESCO-IOC/European Commission (2021) MSPglobal International Guide on Marine/Maritime Spatial Planning. Paris, UNESCO. (IOC Manuals and Guides no 89). Available at: https://unesdoc.unesco.org/ark:/48223/pf0000379196

SPAMI List - RAC/SPA. (2020). Protocol concerning specially protected areas and biological diversity in the Mediterranean, Annex I: Common criteria for the choice of protected marine and coastal areas that could be included in the SPAMI list. https://www.rac-spa.org/sites/default/files/annex/annex_1_en.pdf

Criteria WNBR Statutory Framework Art.9

Edit online (for developers only)

CHAPTER

TWELVE

MEASURES

12.1 Measures by classification

12.1.1 MPA - Development of the activity

Environmentally friendly label

Sector: Aquaculture - Organic "BIO" Label and Farming Methods

Classification: MPA - Development of the activity

Description

Use of a label to certify the environmentally friendly production in terms of the fish comfort and methods utilized. It should lower rearing costs, top-quality water, and organic methods emphasizing low densities and optimal growth.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Mayotte, Parc National des Calanques (France): https://www.provaqua.com/plaquette

Edit online (for developers only)

Integrated multi-trophic aquaculture

Sector: Aquaculture - Integrated Multi-Trophic Aquaculture

Classification: MPA - Development of the activity

Description

Integrated multi-trophic aquaculture to improve efficiency, reduce waste and provide ecosystem services, such as bioremediation

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

Edit online (for developers only)

Organic fish farming regulations

Sector: Aquaculture - MPA Buffer Zone Regulations

Classification: MPA - Development of the activity

Description

Aquaculture allowed if compliant with organic fish farming regulations. (Madeira - Portugal)

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- POGRAMPPS - Network of MPAs of Porto Santo (Madeira): https://issuu.com/parquenaturalmadeira/docs/pogrampps_completo

Edit online (for developers only)

Fishing practices limits

Sector: Fishery - Sustainable Approachs/Practices

Classification: MPA - Socio-ecosystem MPA - Development of the activity

Description

To protect the environment, certain fishing practices, like using trap for catch of lobsters, should limit the time they cover a habitat. For example, leaving traps on top for more than 6 weeks was found to harm seagrass. Therefore, it's recommended to recover traps within a 6-week timeframe, with the optimal soak period not exceeding 4 weeks.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Caribbean (Florida Keys National Marine Sanctuary, USA) (traps): https://www.researchgate.net/profile/Amy-Uhrin/publication/281560202_Effects_of_spiny_lobster_traps_on_seagrass_beds_Damage_assessment_and_evaluation_of_recovery/links/5720d5b808aeaced78906fa0/Effects-of-spiny-lobster-traps-on-seagrass-beds-Damage-assessment-and-evaluation-of-recovery.pdf

Edit online (for developers only)

Optimize land use

Sector: Offshore renewable energy - Socio economic (for both)

Classification: MPA - Socio-ecosystem MPA - Development of the activity

Description

Optimize land use for socio-economic benefits Allocate additional space for various activities to minimize socio-economic impacts associated with implementing energy installations and protected areas.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Compatibility of offshore energy installations with marine protected area: https://www.researchgate.net/publication/336412969_Compatibility_of_offshore_energy_installations_with_marine_protected_area

Edit online (for developers only)

Collaborative farming initiatives

Sector: Aquaculture - Community-Based Contracts

Classification: MPA - Development of the activity

Description

Collaborative farming initiatives for marine species that produce little environmental impact, with positive effects on local ecosystems (through reduction of fishing pressure) and on livelihoods resilience through income diversification. Example: Sea cucumbers and seaweed with positive environmental impact

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Velondriake Locally Managed Marine Area, Madagascar: https://blueventures.org/where-we-work/#madagascar

Edit online (for developers only)

12.1.2 MPA - Limiting the activity

Target species restrictions

Sector: Fishery - Sustainable Approachs/Practices

Classification: MPA - Limiting the activity

Description

Target species restrictions. For example, in New Zealand, ITQ (individual transferable quotes) for all deepwater species.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- New Zealand (trawling and dredging): https://www.sciencedirect.com/science/article/pii/S0308597X09001754

Edit online (for developers only)

Closed areas and closed seasons

Sector: Fishery - Temporal Approaches/Practices

Classification: MPA - Limiting the activity

Description

Closed areas and closed seasons can be enforced to protect fish at times and locations where they are particularly vulnerable. For example, no fishing is permitted within 500m of any river mouth to protect fish aggregating prior to spawning. In Indonesia, spatial restrictions prohibiting using a net within the sea within 100m of the mouth of a river or stream.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Lake Peipus Perch and Pike-perch Fishery, Estonia: https://assets.publishing.service.gov.uk/media/5db0212840f0b609be8c2713/191023_MMO1172_Evaluation_of_MPA_Measures_publication.pdf
- Wakatobi National Park, South East Sulawesi, Indonesia: https://figshare.com/articles/book/Management_of_Marine_Protected_Areas_in_Indonesia_Status_and_Challenges/13341476/1

Edit online (for developers only)

Irregular closures for periodic harvesting

Sector: Fishery - Temporal Approaches/Practices

Classification: MPA - Limiting the activity

Description

Irregular closures for periodic harvesting on a non-predetermined schedule (closures may be from several months to several years, but opening date not set at point of closure).

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Wakatobi National Park, South East Sulawesi, Indonesia: https://figshare.com/articles/book/Management_of_Marine_Protected_Areas_in_Indonesia_Status_and_Challenges/13341476/1

Edit online (for developers only)

Changes in permitted activities

Sector: Fishery - Temporal Approaches/Practices

Classification: MPA - Limiting the activity

Description

Changes in permitted activities many times during a single year at predetermined fixed rates (e.g. fishing allowed on public holidays, weekends etc.). For example, in an MPA in Spain, it is not permitted commercial fishing on Saturdays, Sundays, or public holidays. Recreational fishing is allowed only on weekends and two weekdays each week.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Levante de Mallorca - Cala Ratjada Marine Reserve, Spain: https://www.mapa.gob.es/es/pesca/temas/proteccion-recursos-pesqueros/reservas-marinas-de-espana/levante-de-mallorca-cala-rajada/caracteristicas/

Edit online (for developers only)

Minimum size/weight restrictions

Sector: Fishery - What species or individuals Approaches/Practices

Classification: MPA - Limiting the activity

Description

Minimum size/weight restrictions. For example, in Fiji, the size limits on fish (defined by national law) through fishing net mesh sizes are defined locally.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Kubulau District Locally Managed Marine Area (LMMA), Bua Province, Fiji (2004): https://fiji.wcs.org/Portals/82/Kubulau_EBM_Plan_2009_FINAL.pdf?ver=2010-03-16-232531-840

Edit online (for developers only)

Static gear

Sector: Fishery - "How fishing can occur" Approaches/Practices

Classification: MPA - Limiting the activity

Description

Shift from mobile to static gear can reduce destructive impact.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Evaluation of Marine Protected Area Management Measures Concerning Fishing - UK: https://assets.publishing.service.gov.uk/media/5db0212840f0b609be8c2713/191023_MMO1172_Evaluation_of_MPA_Measures_publication.pdf

Edit online (for developers only)

Membership of fishing cooperative

Sector: Fishery - "Who is allowed to fish" - Cultural and Community Approaches/Practices

Classification: MPA - Socio-ecosystem MPA - Limiting the activity

Description

Fishing activity inside a MPA can require membership of fishing cooperative. For example, in a MPA in Mexico, cooperative members are permitted to commercially fish in one zone where commercial fishing is prohibited for other park users while another zone is directly under concession to the cooperative giving them exclusive commercial fisheries access.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Management Program: national Park of Puerto Morelos, Mexico: https://www.ncei.noaa.gov/data/oceans/coris/library/NOAA/Non-CRCP/non_crcp_publications/national_park_mgmt_prog_puerto_morelos_reefs.pdf

Edit online (for developers only)

Fisheries management recognizing traditional knowledge

Sector: Fishery - "Who is allowed to fish" - Cultural and Community Approaches/Practices

Classification: MPA - Socio-ecosystem MPA - Limiting the activity

Description

MPA fisheries management recognizing local wisdom, traditional knowledge, and customary management of the area. For example, MPAs in eastern Indonesia formally designated period harvest closure zones that are under the management of the local community to decide when to restrict fishing. These zone may have customary fisheries management methods that have been in use for centuries.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Wakatobi National Park, South East Sulawesi, Indonesia: https://figshare.com/articles/book/Management_of_Marine_Protected_Areas_in_Indonesia_Status_and_Challenges/13341476/1

Edit online (for developers only)

Industrial fishery restrictions

Sector: Fishery - "Who is allowed to fish" - Cultural and Community Approaches/Practices

Classification: MPA - Limiting the activity

Description

In some areas it is not allowed industrial fishing (the majority of fishing is subsistence fishing)

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Velondriake, Madagascar: https://journals.sagepub.com/doi/10.1177/194008291000300409

Edit online (for developers only)

12.1.3 MPA - Management process

Local knowledge

Sector: Aquaculture - Regional Collaboration

Classification: MPA - Socio-ecosystem MPA - Management process

Description

Local knowledge in the development of good practices. Example: Experienced aquaculture farmers in Provence-Alpes-Côte d'Azur (PACA) region collaborate for quality fish production.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Mayotte, Parc National des Calanques (France): https://www.provaqua.com/plaquette

Edit online (for developers only)

Assessment of plans and projects

Sector: Aquaculture - Natura 2000 Area Considerations

Classification: MPA - Socio-ecosystem MPA - Management process

Description

Use specific guidance to prevent impacts on ecosystems within Natura 2000 sites. Reference: "Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6 (3) and (4) of the Habitats Directive 92/43/EEC"

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- General EU - Habitats Directive: https://op.europa.eu/en/publication-detail/-/publication/3c04edd0-8e4e-11e9-9369-01aa75ed71a1

Edit online (for developers only)

Adaptive Risk Management

Sector: Aquaculture - General Planning Rules based on

Classification: MPA - Management process

Description

Adaptive Risk Management: Informed aquaculture developments in MPAs based on ongoing monitoring and comparison with reference sites inside or outside an MPA.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- England MPAs: https://sweep.ac.uk/wp-content/uploads/2023/01/019-Mariculture-and-MPA-Policy-Brief.pdf

Edit online (for developers only)

Comprehensive investigations

Sector: Aquaculture - Natura 2000 Area Considerations

Classification: MPA - Socio-ecosystem MPA - Management process

Description

Comprehensive investigations for new fish farms in designated areas, safety zones during nesting times

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Southwest Finland and Satakunta: https://op.europa.eu/en/publication-detail/-/publication/3c04edd0-8e4e-11e9-9369-01aa75ed71a1

Edit online (for developers only)

Habitat Feature Sensitivity Matrices

Sector: Aquaculture - General Planning Rules based on

Classification: MPA - Management process

Description

Habitat Feature Sensitivity Matrices: Risk assessment based on feature-specific matrices and environmental monitoring data. Risk matrices and environmental monitoring data from existing sites quantifying aquaculture x MPA feature interactions;

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- England MPAs: https://sweep.ac.uk/wp-content/uploads/2023/01/019-Mariculture-and-MPA-Policy-Brief.pdf

Edit online (for developers only)

Ecosystem Service Tools

Sector: Aquaculture - General Planning Rules based on

Classification: MPA - Socio-ecosystem MPA - Management process

Description

Ecosystem Service Tools: Tools to quantify benefits like habitat provisioning, coastal protection, nutrient regulation, and carbon sequestration.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- England MPAs: https://sweep.ac.uk/wp-content/uploads/2023/01/019-Mariculture-and-MPA-Policy-Brief.pdf

Edit online (for developers only)

Implement effective monitoring practices

Sector: Offshore renewable energy - Socio economic (for both)

Classification: MPA - Management process

Description

Implement effective monitoring practices Conduct pre-construction surveys and routine monitoring of installation sites during operation to enhance monitoring and management capabilities

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Compatibility of offshore energy installations with marine protected area: https://www.researchgate.net/publication/336412969_Compatibility_of_offshore_energy_installations_with_marine_protected_area

Edit online (for developers only)

Facilitate stakeholder engagement

Sector: Offshore renewable energy - Socio economic (for both)

Classification: MPA - Socio-ecosystem MPA - Management process

Description

Facilitate stakeholder engagement for sustainability Create opportunities for stakeholder engagement with developers to enhance sustainability credentials and implement best environmental practices.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Compatibility of offshore energy installations with marine protected area: https://www.researchgate.net/publication/336412969_Compatibility_of_offshore_energy_installations_with_marine_protected_area

Edit online (for developers only)

Buffer zones

Sector: Offshore renewable energy - Planning and site selection OWF

Classification: MPA - Socio-ecosystem MPA - Management process

Description

Design buffer zones on a case-by-case basis, taking into account the specific technical and ecological characteristics of the protected area.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Mediterranean marine protected areas: https://academic.oup.com/icesjms/advance-article/doi/10.1093/icesjms/fsad131/7246576

Edit online (for developers only)

Avoid major migration corridors and sensitive habitats

Sector: Offshore renewable energy - Planning and site selection

Classification: MPA - Socio-ecosystem MPA - Management process

Description

Site selection and review process to avoid major migration corridors and sensitive habitats. Example: set up on-board observers to prevent disturbance to visible migrating marine species (turtles, marine mammals, etc.)

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Cape Breton Coastal Region inclusive of the Bras d'Or Lakes Biosphere Region: https://oera.ca/research/marine-renewable-energy-background-report-support-strategic-environmental-assessment-sea

Edit online (for developers only)

12.1.4 MPA - Socio-ecosystem

leaving infrastructure with ecological community

Sector: Offshore renewable energy - Decommissioning

Classification: MPA - Socio-ecosystem

Description

It should be considered leaving some windfarm infrastructure in place during decommissioning if it has led to the development of a significant ecological community on the hard substrata

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Mitigating biodiversity impacts associated with solar and wind energy: https://portals.iucn.org/library/sites/library/files/documents/2021-004-En.pdf

Edit online (for developers only)

Criteria for fishing permissions

Sector: Fishery - "Who is allowed to fish" - Cultural and Community Approaches/Practices

Classification: MPA - Socio-ecosystem

Description

Cultural ties or residency as criteria for fishing permissions. For example, in the Ulithi Atoll it is needed to have cultural ties ot residency to have the permition to fish. In Cambodia, only residents can fish inside the MPA.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Koh Rong Archipelago Marine Fisheries Management Area, Preah Sihanouk Province, Cambodia (2016): https://www.researchgate.net/profile/Jennifer-Daltry/publication/274380259_Cambodian_Journal_of_Natural_History_Volume_2014_Issue_1/links/551d3cdd0cf2a153362613cb/Cambodian-Journal-of-Natural-History-Volume-2014-Issue-1.pdf#page=57
- Outer Islands of Yap State, Federated States of Micronesia (centuries old): https://www.frontiersin.org/articles/10.3389/fmars.2023.1099579/full#T3

Edit online (for developers only)

12.1.5 MSP - Development of the activity

Sea Garden Community

Sector: Aquaculture - Community-Based Contracts

Classification: MSP - Development of the activity

Description

Sea Garden Community in Ebeltoft harbor (Denmark). - Collaborative shellfish and seaweed small scale farming for the local community with the aim to restore life to fishing ports and contribute to a cleaner environment. The association includes different types of stakeholders and an active cooperation with other associations, institutions and business

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Sea Garden Community: https://webgate.ec.europa.eu/fpfis/cms/farnet2/on-the-ground/good-practice/projects/community-sea-gardens_en.html

Edit online (for developers only)

Environmental performance reports

Sector: Marine non-living resources - Annual Reports Using EMS Data

Classification: MSP - Development of the activity MSP - Management process

Description

Annual summaries guide environmental performance reports, highlighting regional differences in dredging patterns. This analysis support industry to control and manage extraction operations.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- United Kingdom: https://ices-library.figshare.com/articles/report/Effects_of_extraction_of_marine_sediments_on_the_marine_environment_2005-2011/18624086

Edit online (for developers only)

Code of Good Practice

Sector: Aquaculture - Artisanal Fish Farming Commitments

Classification: MSP - Development of the activity

Description

Code of Good Practice: Voluntary guidelines addressing cage design, prophylaxis, and operational practices

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Scotland's National Marine Plan: https://www.gov.scot/publications/scotlands-national-marine-plan/pages/8/

Edit online (for developers only)

Agreement among artisanal fish farming

Sector: Aquaculture - Artisanal Fish Farming Commitments

Classification: MSP - Development of the activity

Description

Development and agreement among artisanal fish farming to follow best practices and the development of the activity. Example: Open sea farming commitment to natural growth, healthy diet, and extreme freshness (no more than 48h from capture to deliver).

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Mayotte, Parc National des Calanques (France): https://www.provaqua.com/plaquette

Edit online (for developers only)

Temporary reserve area

Sector: Marine non-living resources - Deep-sea Mining

Classification: MSP - Development of the activity

Description

Establish temporary reserve area of similar size and character to the one being explored to serve as a possible source for natural repopulation of the mine site. Example: Papua New Guinea mineral extraction.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Papua New Guinea: https://www.nature.com/articles/470031a

Edit online (for developers only)

Study the environment

Sector: Marine non-living resources - Deep-sea Mining

Classification: MSP - Socio-ecosystem MSP - Development of the activity

Description

Encourage mining companies to study the environment outside their mining areas.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- ISA - Northern Mid-Atlantic Ridge: https://www.isa.org.jm/wp-content/uploads/2022/12/2212833E.pdf

Edit online (for developers only)

Inclusive design

Sector: Offshore renewable energy - Sector-environment

Classification: MSP - Socio-ecosystem MSP - Development of the activity

Description

Inclusive design: Explore designs for the underwater portions of wind turbines to promote colonization and provide shelter opportunities for marine organisms, while also accommodating aquaculture needs.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Strangford Lough - Northern Ireland: https://link.springer.com/article/10.1007/s10531-016-1268-6

Edit online (for developers only)

Circular Economy

Sector: Marine non-living resources - Deep-sea Mining

Classification: MSP - Development of the activity

Description

Look for ways to reuse, recycle, and design products more sustainably. Circular Economy

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- General: https://www.frontiersin.org/articles/10.3389/fmars.2018.00480/full

Edit online (for developers only)

New solutions

Sector: Offshore renewable energy - Environmental impact mitigation OWF

Classification: MSP - Development of the activity

Description

New solutions to address spills and alternatives for toxic antifouling methods should be explored. Example: Vegetable-based hydraulic fluids for spills and less toxic alternatives for antifouling chemicals

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Mediterranean blue economy Recommendations: https://pharos4mpas.interreg-med.eu/fileadmin/user_upload/Sites/Biodiversity_Protection/Projects/PHAROS4MPAs/OWF_RECOMMENDATIONS_single_page_OK.pdf

Edit online (for developers only)

Minimize sediment resuspension and noise

Sector: Offshore renewable energy - Environmental impact mitigation OWF

Classification: MSP - Development of the activity

Description

Employ techniques that minimize sediment resuspension, and noise during both cable laying and infrastructure construction. Example: horizontal drilling for cable laying and bubble curtains for noise.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Mediterranean blue economy Recommendations: https://pharos4mpas.interreg-med.eu/fileadmin/user_upload/Sites/Biodiversity_Protection/Projects/PHAROS4MPAs/OWF_RECOMMENDATIONS_single_page_OK.pdf

Edit online (for developers only)

Burying/shielding cables

Sector: Offshore renewable energy - Environmental impact mitigation OWF

Classification: MSP - Development of the activity

Description

Opt for burying/shielding cables with eco-friendly materials that facilitate habitat regrowth. Example: Econcrete

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Canary Islands - Econcrete: https://econcretetech.com/wp-content/uploads/2023/04/Ecological-Submarine-Cable-Protection-Case-Study-Red-Electrica-ECOncrete-English.pdf

Edit online (for developers only)

Quantitative analysis

Sector: Marine non-living resources - Importance of EMS Data

Classification: MSP - Development of the activity

Description

Quantitative analysis of dredging impact, supporting monitoring process.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Belgium: https://ices-library.figshare.com/articles/report/Effects_of_extraction_of_marine_sediments_on_the_marine_environment_2005-2011/18624086

Edit online (for developers only)

Voluntary Initiative for Information Sharing

Sector: Marine non-living resources - Importance of EMS Data

Classification: MSP - Development of the activity

Description

Voluntary Initiative for Information Sharing: Industry and Crown Estate share aggregate extraction data every six months. Open access on the internet to reduce adverse interactions with other sectors.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Belgium: https://ices-library.figshare.com/articles/report/Effects_of_extraction_of_marine_sediments_on_the_marine_environment_2005-2011/18624086

Edit online (for developers only)

Nature enhancement

Sector: Offshore renewable energy - Sector-environment

Classification: MSP - Socio-ecosystem MSP - Development of the activity

Description

Nature enhancement: Well manage, the addition of hard subtract and exclusion of benthic disturbance like bottom trawling give the opportunity for benthic habitat recover. Example: in the Dutch North Sea oyster restoration is been developed in wind farms areas.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Nature enhancement in offshore wind farms, the Netherlands: https://www.2020.submariner-network.eu/images/multi-frame/mf-multi-use-blueprint-2.pdf

Edit online (for developers only)

Burying submarine cables

Sector: Offshore renewable energy - Environmental impact mitigation

Classification: MSP - Development of the activity

Description

Undersea cables within ocean energy development arrays and landfall connections can be buried to minimize Electric Magnetic Field (EMF) impacts. Example: Faraday cages for EMF elimination around wave energy devices.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Renewable energy technologies and migratory species: guidelines for sustainable deployment: https://www.cms.int/sites/default/files/document/Doc_10_2_2_Guidelines_Renewable_Energy_E.pdf

Edit online (for developers only)

Vegetable-based hydraulic fluids

Sector: Offshore renewable energy - Environmental impact mitigation

Classification: MSP - Development of the activity

Description

Enhance spill mitigation efforts by adopting vegetable-based hydraulic fluids instead of petroleum-based alternatives.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Renewable energy technologies and migratory species: guidelines for sustainable deployment: https://www.cms.int/sites/default/files/document/Doc_10_2_2_Guidelines_Renewable_Energy_E.pdf

Edit online (for developers only)

Vulnerable species assessment

Sector: Offshore renewable energy - Environmental impact mitigation

Classification: MSP - Development of the activity

Description

Assessment to determine the compatibility of energy installations with the maintenance or recovery of vulnerable species. Example: optimize conditions for colonization, provide shelter opportunities, and address aquaculture needs within marine environments

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Strangford, County Down, Northern Ireland: https://www.researchgate.net/publication/336412969_Compatibility_of_offshore_energy_installations_with_marine_protected_area

Edit online (for developers only)

Miminizing the use of slack or loose tether

Sector: Offshore renewable energy - Environmental impact mitigation

Classification: MSP - Development of the activity

Description

Miminizing the use of slack or loose tether and anchor lines during installation and operation activities could prevent entanglement risk to marine species

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Pacific North West: https://tethys.pnnl.gov/sites/default/files/publications/Ecological_effect_wave_workshop_high_res.pdf

Edit online (for developers only)

Long lifespan of structures

Sector: Offshore renewable energy - Long-term biodiversity

Classification: MSP - Socio-ecosystem MSP - Development of the activity

Description

Long lifespan of structures and possibility for sites to remain in place one decommissioned offer long-term protection once construction is complete.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Strangford, County Down, Northern Ireland: https://www.researchgate.net/publication/336412969_Compatibility_of_offshore_energy_installations_with_marine_protected_area

Edit online (for developers only)

Noise-deflecting devices

Sector: Offshore renewable energy - Environmental impact mitigation

Classification: MSP - Development of the activity

Description

Installation of noise-deflecting devices during phases will proactively prevent physiological impacts on marine life.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Makah Bay - Pacific North West: https://tethys.pnnl.gov/sites/default/files/publications/Ecological_effect_wave_workshop_high_res.pdf

Edit online (for developers only)

Use of new devices

Sector: Fishery - "How fishing can occur" Approaches/Practices

Classification: MSP - Development of the activity

Description

Use of new devices, such as semi-flexibe exclusion grid to reduce bycatch of cetaceans, turtles and elasmobranquio. For example, in Australia, the use of semi-flexible exclusion grid with a bar spacing of 15.5 cm reduced dolphin bycatch trawl fishery by close to 50% and reduced the bycatch of sea turtles, large sharks and rays.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Western Australia (Pilbara) (trawl nets): https://www.fish.wa.gov.au/Documents/research_reports/frr171.pdf

Edit online (for developers only)

Gear marking

Sector: Fishery - Sustainable Approachs/Practices

Classification: MSP - Development of the activity

Description

Gear marking can be implemented to facilitate an effective tracking of fishing gear and minimize loss of gear therefore reduce entanglements. For example, in Atlantic Canada and Quebec gear marking is required for all non-tended fixed gear fisheries, including lobster and crab.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Canada snow crab and lobster fishery (long-line; static gear): https://www.dfo-mpo.gc.ca/fisheries-peches/commercial-commerciale/atl-arc/narw-bnan/management-gestion-eng.html

Edit online (for developers only)

Notify authority in advance

Sector: Fishery - Sustainable Approachs/Practices

Classification: MSP - Development of the activity

Description

Fishers are required to notify authority in advance of their fishing trip so that the authority can determine if an observer is needed.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- USA federal EEZ and State waters of the Bering Sea-Aleutian Islands (pelagic trawling): https://www.google.es/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwj-8smb2-2BAxV3cKQEHUI-D0UQFnoECAoQAQ&url=https%3A%2F%2Fcert.msc.org%2FFileLoader%2FFileLinkDownload.asmx%2FGetFile%3FencryptedKey%3Dv5NA0jNkiUZRzn52Lf%2FKM5Ylxb3g6nRc8mRKhTsxOdE4pwpZXgAkpouYs6bJWuLB&usg=AOvVaw1byg-TN0Zvf9mV-ClS

Edit online (for developers only)

Alternative installation methods

Sector: Offshore renewable energy - Planning and site selection OWF

Classification: MSP - Development of the activity

Description

Alternative installation methods should be explored to minimize environmental impact. Example: tripod, jacket, gravity foundations or nature-inclusive design approach for infrastructures

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Renewable energy technologies and migratory species: guidelines for sustainable deployment: https://www.cms.int/sites/default/files/document/Doc_10_2_2_Guidelines_Renewable_Energy_E.pdf

Edit online (for developers only)

Bird-scaring lines or Tori lines

Sector: Fishery - “How fishing can occur” Approaches/Practices

Classification: MSP - Development of the activity

Description

For bird bycatch reduction, Bird-scaring lines or Tori lines can be introduced as a requirement of the license. For example, in South Africa Seabird bycatch reduction methods are now included in license conditions for the deep-sea trawl fishery

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- South Africa: https://www.google.es/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwi-wKSA3e2BAxXyUKQEHQCXI_UQFnoECAsQAQ&url=https%3A%2F%2Fcert.msc.org%2FFileLoader%2FFileLinkDownload.asmx%2FGetFile%3FencryptedKey%3DvHSM5x0G%2BDw6xk0Pbh8zBLsCccsNCYWmkBQZ9AlPHIZBE4DuKP0V5NyY730%2BqIuL&usg=AOvVaw3W9fmMX2sJTbT-Dd

Edit online (for developers only)

Grid connections

Sector: Offshore renewable energy - Planning and site selection OWF

Classification: MSP - Development of the activity

Description

Plan and share grid connections between multiples OWFs creating appropriate routes for cable trenches to optimize the use of available infrastructure, minimizing environmental impact

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Mediterranean blue economy Recommendations: https://pharos4mpas.interreg-med.eu/fileadmin/user_upload/Sites/Biodiversity_Protection/Projects/PHAROS4MPAs/OWF_RECOMMENDATIONS_single_page_OK.pdf

Edit online (for developers only)

Turbine layouts

Sector: Offshore renewable energy - Environmental impact mitigation OWF

Classification: MSP - Development of the activity

Description

Turbine layouts should be planned to avoid barrier effects: placing turbines parallel to migration routes, planning corridors between clusters for safe flight routes, and increase space underneath rotor blades to reduce collision rates for local birds.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Renewable energy technologies and migratory species: guidelines for sustainable deployment: https://www.cms.int/sites/default/files/document/Doc_10_2_2_Guidelines_Renewable_Energy_E.pdf

Edit online (for developers only)

12.1.6 MSP - Limiting the activity

Exclusion zones in archaeological features

Sector: Marine non-living resources - Seabed Mapping and Archaeological Considerations

Classification: MSP - Limiting the activity

Description

Restrictions in area archaeological features are encountered. Exclusion zones should be employed.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- United Kingdom: https://ices-library.figshare.com/articles/report/Effects_of_extraction_of_marine_sediments_on_the_marine_environment_2005-2011/18624086

Edit online (for developers only)

Exclusion zones for sensitive features

Sector: Marine non-living resources - Environmental aspects

Classification: MSP - Limiting the activity

Description

Use of exclusion zones to protect sensitive features.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- United Kingdom: https://ices-library.figshare.com/articles/report/Effects_of_extraction_of_marine_sediments_on_the_marine_environment_2005-2011/18624086

Edit online (for developers only)

Protocols of safe operation

Sector: Marine non-living resources - Seabed Mapping and Archaeological Considerations

Classification: MSP - Limiting the activity MSP - Management process

Description

Protocols of safe operation: i) stop activities for historical, archaeological, or scientific findings; ii) for new findings (historical, archaeological and or scientific) reporting to competent authorities and adjust operation to minimize further impact; iii) establishment of buffer zones around this new findings.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Netherlands: https://www.ecoshape.org/en/pilots/sea-bed-landscaping/

Edit online (for developers only)

Safety distance of the ETP and VME

Sector: Fishery - "How fishing can occur" Approaches/Practices

Classification: MSP - Limiting the activity

Description

Once the catches of a relevant volume or number of ETP (Endangered, Threatened, Protected) species or VME (Vulnerable Marine Ecosystems) habitat forming species, the vessel will move a minimum of ?X'NM (safety distance of the ETP and VME) before continuing it activity.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Agarba vessels (Spanish fleet - Cod) working on Norway EEZ: https://www.google.es/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjzzdnL0u2BAxV3VaQEHTImCS4QFnoECAwQAQ&url=https%3A%2F%2Fcert.msc.org%2FFileLoader%2FFileLinkDownload.asmx%2FGetFile%3FencryptedKey%3DDtw7G9sGU5aC0%2FnO8PkXZsD572K4GDf3%2FT1DwXbzMv5KM6LOnX4PsOXj9%2FWAJ6a0&usg=AOvVaw1Sjt2bs_xjOgFy

Edit online (for developers only)

Physical barriers

Sector: Fishery - Sustainable Approachs/Practices

Classification: MSP - Limiting the activity

Description

Creation of physical barriers to hinder or impede illegal fishing activities. Example. Artistic sculptures on the seafloor

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Artistic sculptures on the seafloor: https://www.nationalgeographic.co.uk/environment-and-conservation/2022/02/off-the-coast-of-italy-a-radical-approach-to-battling-illegal-fishing-a-seafloor-sculpture-museum

Edit online (for developers only)

Closed areas to different levels of fishing

Sector: Fishery - Sustainable Approachs/Practices

Classification: MSP - Socio-ecosystem MSP - Limiting the activity

Description

Large areas of sensitive habitats are closed to different levels of fishing (e.g. all bottom contact gear; all mobile bottom contact gear; no contact with bottom permitted).

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- USA federal EEZ and State waters of the Bering Sea-Aleutian Islands (pelagic trawling): https://www.google.es/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwj-8smb2-2BAxV3cKQEHUI-D0UQFnoECAoQAQ&url=https%3A%2F%2Fcert.msc.org%2FFileLoader%2FFileLinkDownload.asmx%2FGetFile%3FencryptedKey%3Dv5NA0jNkiUZRzn52Lf%2FKM5Ylxb3g6nRc8mRKhTsxOdE4pwpZXgAkpouYs6bJWuLB&usg=AOvVaw1byg-TN0Zvf9mV-ClS

Edit online (for developers only)

Benthic protection areas bottom trawling

Sector: Fishery - Spatial Approaches/Practices

Classification: MSP - Limiting the activity MSP - Management process

Description

Establishment of benthic protection areas bottom trawling with measures such as: i) individual transferable quotes, and ii) observes and electronic net monitoring system. For example, a season-long area closure for fishery can be established to safeguard ETP (Endangered, Threatened, Protected) species. For a more effective measure, the area can be adjusted every year, based on data from the previous year. Example: In Canada, snow crab and lobster fishery is not allowed whilst whales are in the area.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- New Zealand (trawling and dredging): https://www.sciencedirect.com/science/article/pii/S0308597X09001754
- Canada snow crab and lobster fishery (long-line; static gear): https://www.dfo-mpo.gc.ca/fisheries-peches/commercial-commerciale/atl-arc/narw-bnan/management-gestion-eng.html

Edit online (for developers only)

12.1.7 MSP - Management process

Educational awareness

Sector: Aquaculture - Integrated Multi-Trophic Aquaculture

Classification: MSP - Socio-ecosystem MSP - Management process

Description

Educational awareness and increase the importance of aquaculture in society

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

Edit online (for developers only)

Plan and implement protected areas

Sector: Marine non-living resources - Deep-sea Mining

Classification: MSP - Management process

Description

Plan and implement protected areas previous than mineral exploration started. Example: In the abyssal plain of Clarion-Clipperton Zone (CCZ), protected areas must be identified two years previous any mineral exploration throughout the identification of Areas of Particular Environmental Interest (APEIs), later protected from all mining activities.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- ISA - Environmental management plan for Clarion-Clipperton Zone: https://oceanfdn.org/sites/default/files/ISA%20-%20Environmental%20management%20plan%20for%20Clarion-Clipperton%20Zone.%20.pdf

Edit online (for developers only)

Seabed mapping

Sector: Marine non-living resources - Seabed Mapping and Archaeological Considerations

Classification: MSP - Socio-ecosystem MSP - Management process

Description

Seabed mapping before dredging to locate wrecks, debris and submerged prehistoric landscapes.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- United Kingdom: https://ices-library.figshare.com/articles/report/Effects_of_extraction_of_marine_sediments_on_the_marine_environment_2005-2011/18624086

Edit online (for developers only)

Ensure no adverse effects

Sector: Aquaculture - Habitats Regulation Appraisal (HRA)

Classification: MSP - Socio-ecosystem MSP - Management process

Description

Required for projects to ensure no adverse effects on site integrity.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Scotland's National Marine Plan: https://www.gov.scot/publications/scotlands-national-marine-plan/pages/8/

Edit online (for developers only)

Code for environmental management

Sector: Marine non-living resources - Deep-sea Mining

Classification: MSP - Management process

Description

Code for environmental management of marine mining - model for legally binding legislation on marine mining

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- General: https://www.immsoc.org/_files/ugd/cacc41_6af11202e89a4040ba4ffcf8b44d7063.pdf

Edit online (for developers only)

Decommission

Sector: Marine non-living resources - Oil and Gas

Classification: MSP - Socio-ecosystem MSP - Management process

Description

Decommission: Use the oil and gas infrastructure to create artificial reefs. In the Guld of Mexico, oil and gas operator may choose to work with local government in a Rigs-to-Reef program minimizing decommissioning costs and improving biodiversity

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Oil & Gas Platforms in the Gulf of Mexico, United States: https://www.2020.submariner-network.eu/images/multi-frame/mf-multi-use-blueprint-10.pdf

Edit online (for developers only)

Regional Environmental Management Plans

Sector: Marine non-living resources - Deep-sea Mining

Classification: MSP - Socio-ecosystem MSP - Management process

Description

Use Regional Environmental Management Plans (REMPs) to protect the sea environment.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- General: https://www.isa.org.jm/protection-of-the-marine-environment/regional-environmental-management-plans/

Edit online (for developers only)

Mapping habitats

Sector: Fishery - Spatial Approaches/Practices

Classification: MSP - Socio-ecosystem MSP - Management process

Description

Mapping habitats: for identification of sensitive habitats and fauna, for a more sustainable and rentability of the fishery activity.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Eastern Canada (Scallop fisheries - dredging): https://www.google.es/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwirxo2bzO2BAxU1WqQEHdN9AkMQFnoECAsQAQ&url=https%3A%2F%2Fcert.msc.org%2FFileLoader%2FFileLinkDownload.asmx%2FGetFile%3FencryptedKey%3DeE1rODhv0CVUIGP7JgahQzcBlXffE06pwVw6R4qLxmdnUdejvgOvT45iCic%2FHnPG&usg=AOvVaw0DtmHB4OTNz-k4shqy

Edit online (for developers only)

Involvement of local communities

Sector: Fishery - "Who is allowed to fish" - Cultural and Community Approaches/Practices

Classification: MSP - Socio-ecosystem MSP - Management process

Description

Involvement of local communities in participatory management of important habitats for fishery community. For example, In Ecuador and Peru the participatory management fishing communities are responsible for preserving and restoring ecosystems while monitoring the state of the biodiversity flora and fauna and reporting the loss of vegetation or species to the environmental authorities, thus working on implementing restoration actions.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Artisanal, small-scale fisheries and mangrove restoration – Peru & Ecuador: https://www.2020.submariner-network.eu/images/multi-frame/mf-multi-use-blueprint-11.pdf

Edit online (for developers only)

Vessel mapping updated cartography

Sector: Fishery - Spatial Approaches/Practices

Classification: MSP - Management process

Description

Vessel mapping updated cartography to enable vessels to avoid areas of VME, proximity alert system.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Agarba vessels (Spanish fleet - Cod) working on Norway EEZ: https://www.google.es/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjzzdnL0u2BAxV3VaQEHTImCS4QFnoECAwQAQ&url=https%3A%2F%2Fcert.msc.org%2FFileLoader%2FFileLinkDownload.asmx%2FGetFile%3FencryptedKey%3DDtw7G9sGU5aC0%2FnO8PkXZsD572K4GDf3%2FT1DwXbzMv5KM6LOnX4PsOXj9%2FWAJ6a0&usg=AOvVaw1Sjt2bs_xjOgFy

Edit online (for developers only)

Sensitivity maps

Sector: Offshore renewable energy - Planning and site selection OWF

Classification: MSP - Socio-ecosystem MSP - Management process

Description

Sensitivity maps in the MSP process can be used to inform the selection of suitable sites.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- Mediterranean blue economy Recommendations: https://pharos4mpas.interreg-med.eu/fileadmin/user_upload/Sites/Biodiversity_Protection/Projects/PHAROS4MPAs/OWF_RECOMMENDATIONS_single_page_OK.pdf

Edit online (for developers only)

Zoning scheme

Sector: Marine non-living resources - Deep-sea Mining

Classification: MSP - Management process

Description

A zoning scheme should be developed before any exploitation activities, for example, a core zone of full protection to maintain the sustainability of biological populations; a buffer zone of sufficient size to protect the core zone from indirect effects. For example: In the Clarion-Clipperton Zone (Pacific Ocean) the following measures were taken: i) Establish MPAs at least two years prior to prototype mining; ii) identified 'Areas of Particular Environmental Interest', surrounded by a buffer zone extending 100 km in each direction.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- ISA - Northern Mid-Atlantic Ridge Seabed Authority environmental management plan: https://www.isa.org.jm/wp-content/uploads/2022/12/2212833E.pdf

Edit online (for developers only)

12.1.8 MSP - Socio-ecosystem

Means for the returning of a species

Sector: Marine non-living resources - Environmental aspects

Classification: MSP - Socio-ecosystem

Description

Provide a means for the returning of a species to re-establish in the environment. For example: Re-seeding i.e., Scallop shell seeding for quick species return. Resulting in a return of 70% of species in seven months, which would have required more than five years for natural recolonization.

Notes Pegorelli et al. (2024). Guideline for the strategic and spatial measures for the nature inclusive operation of blue economy sectors – ESE 3 (Deliverable – D4.2., under the WP4 of MSP4BIO project (GA n° 101060707)).

External sources

- United Kingdom: https://ices-library.figshare.com/articles/report/Effects_of_extraction_of_marine_sediments_on_the_marine_environment_2005-2011/18624086

Edit online (for developers only)

12.2 Measures by sectors

12.2.1 Aquaculture

12.2.2 Fishery

12.2.3 Marine non-living resources

12.2.4 Offshore renewable energy

CHAPTER

THIRTEEN

OPERATIONAL APPROACHES

13.1 Core methods

13.1.1 Dispersion and connectivity modelling

Child operational approaches

- *Pressure assessment of MARine activities (PMAR) module*

Related questions

- *Q 7 - How to protect deep Vulnerable marine Ecosystems (VMEs) (strategies, measures, etc.)?*
- *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*
- *Q 17 - How to identify priority areas for conservation of pelagic biodiversity?*
- *Q 18 - How to identify priority areas for preserving/restoring reef-forming species such as oysters Lanice conchilega or mussels?*
- *Q 34 - How to achieve the strict protection area target of 10% by 2030 in marine areas?*
- *Q 36 - How to maintain mobile species persistence (and connectivity) and population/community persistence (passive connectivity) across a transboundary MPA?*
- *Q 37 - How to maintain local retention / population persistence within the MPA?*
- *Q 41 - What are the main objectives and elements of monitoring programs for MPAs?*
- *Q 55 - How to anticipate and address climate change within a MPA network?*
- *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*
- *Q 17 - How to identify priority areas for conservation of pelagic biodiversity?*
- *Q 18 - How to identify priority areas for preserving/restoring reef-forming species such as oysters Lanice conchilega or mussels?*

Description

Tools incorporating connectivity through the explicit consideration of dispersion (active and passive) and migration processes (functional connectivity) and seascape features that facilitate or prevent the movement of organisms (structural connectivity) are still rare.

Currently, Zonation 5 and PlanWise4Blue are able to consider connectivity in their prioritization algorithms. This is mainly done through the consideration of structural aspects of habitats that facilitate the movement of species (habitat cohesion and integrity, corridors) when prioritizing different conservation strategies.

Functional connectivity, i.e., the actual movement of organisms, has not been explicitly and effectively incorporated in the assessed tools. The difficulties to generate reliable data (thing that has been changing in the last decade with the improvement of tracking technologies and methods for the analysis of genetic and chemical markers) and the computational demands of algorithms used to model different connectivity processes have prevented the effective consideration of functional connectivity in decision-making processes. However, a recent academic exercise using Symphony has shown how to incorporate information on larval dispersion derived from a Lagrangian particle-tracking model in a CEA (Jonsson et al., 2021).

Notes Source: Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

13.1.2 Cumulative Effects Assessment (CEA)

Child operational approaches

- *Tools4MSP CEA*
- *HELCOM SPIA Tool*
- *PlanWise4Blue*

Related questions

- *Q 7 - How to protect deep Vulnerable marine Ecosystems (VMEs) (strategies, measures, etc.)?*
- *Q 25 - How to integrate the process of MPA designation or extension in MSP?*
- *Q 39 - What criteria are available to assess sustainability of maritime uses?*
- *Q 41 - What are the main objectives and elements of monitoring programs for MPAs?*
- *Q 64 - How to deal with knowledge gaps on impacts of maritime activities, including cumulative impacts?*
- *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*
- *Q 64 - How to deal with knowledge gaps on impacts of maritime activities, including cumulative impacts?*
- *Q 24 - How do MPA policies intersect with MSP?*
- *Q 64 - How to deal with knowledge gaps on impacts of maritime activities, including cumulative impacts?*
- *Q 64 - How to deal with knowledge gaps on impacts of maritime activities, including cumulative impacts?*

Description

CEA is the process of systematically analysing and assessing cumulative environmental change. The purpose of CEA is to ensure that the full range of consequences of actions is considered.

Cumulative impacts can occur over different temporal and spatial scales by interacting, combining and compounding so that the overall effect often exceeds the simple sum of previous effects.

The spatial scale can be local, regional or global, whilst the frequency or temporal scale includes past, present and future impacts on a specific environment or region. Cumulative effects can simply be defined as the total impact that a series of developments, either present, past or future, will have on the environment within a specific region over a particular period of time.

Notes Source: DEAT (2004) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

Edit online (for developers only)

13.1.3 Climate change impact assessment

Child operational approaches

- *CC Analog Base Velocities*

Related questions

- *Q 25 - How to integrate the process of MPA designation or extension in MSP?*
- *Q 34 - How to achieve the strict protection area target of 10% by 2030 in marine areas?*
- *Q 41 - What are the main objectives and elements of monitoring programs for MPAs?*
- *Q 50 - How can deep-water VMEs be effectively identified and conserved with regards to anthropogenic impacts arising from human activities?*
- *Q 59 - What is the impact of CC on marine mammals?*
- *Q 60 - What is the impact of CC on deep ecosystems?*
- *Q 41 - What are the main objectives and elements of monitoring programs for MPAs?*
- *Q 55 - How to anticipate and address climate change within a MPA network?*
- *Q 56 - How to anticipate changes in biotopes due to climate change?*
- *Q 65 - How can we assess CC impacts on fishing stocks (e.g. cod and sprat) and develop strategies to protect these species across different life stages (e.g. focusing on nurseries and fishing grounds)?*

Description

Different tools have already or are in the processes of incorporating applications for the analysis of the effects of climate change on relevant natures values. A promising development in the frame of the MSP4BIO is a prototype for the use of analog-based climate velocity for climate adaptation planning withing the Tools4MSP geoplatform.

Notes Source: Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

13.1.4 Trade-off for MPA Design

Child operational approaches

- *Trade-off for MPA Design - Conservation and economic development*
- *Trade-off for MPA Design - Short-term and long-term benefits*
- *Trade-off for MPA Design - Exclusives uses and shared uses*
- *Trade-off for MPA Design - Specific stakeholder interests*
- *Trade-off for MPA Design - Local and global interests*
- *Participatory mapping*

Related questions

- *Q 8 - How to identify and analyze the main conflict area that may arise if we need to expand marine protected areas in response to sensitive habitats, ecological connectivity or other valuable ecological as*
- *Q 11 - How to integrate socio-econonomic objectives in assessment of existing MPA (network) and identification of new MPAs?*
- *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*
- *Q 13 - How to evaluate trade-offs in MSP and MPA designation process?*
- *Q 14 - How to assess compatibility of maritime uses and MPA conservation objectives? How to prioritize uses?*
- *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
- *Q 46 - Hot to identify compensation measures and how to assess their effectiveness?*
- *Q 54 - How to anticipate and address climate change within MPA?*
- *Q 17 - How to identify priority areas for conservation of pelagic biodiversity?*
- *Q 18 - How to identify priority areas for preserving/restoring reef-forming species such as oysters Lanice conchilega or mussels?*
- *Q 25 - How to integrate the process of MPA designation or extension in MSP?*
- *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
- *Q 45 - How to assess economic impacts of conservation measures?*
- *Q 46 - Hot to identify compensation measures and how to assess their effectiveness?*
- *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
- *Q 46 - Hot to identify compensation measures and how to assess their effectiveness?*
- *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
- *Q 46 - Hot to identify compensation measures and how to assess their effectiveness?*
- *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
- *Q 45 - How to assess economic impacts of conservation measures?*
- *Q 46 - Hot to identify compensation measures and how to assess their effectiveness?*
- *Q 17 - How to identify priority areas for conservation of pelagic biodiversity?*
- *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
- *Q 46 - Hot to identify compensation measures and how to assess their effectiveness?*

- *Q 8 - How to identify and analyze the main conflict area that may arise if we need to expand marine protected areas in response to sensitive habitats, ecological connectivity or other valuable ecological as*
- *Q 11 - How to integrate socio-econonomic objectives in assessment of existing MPA (network) and identification of new MPAs?*
- *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*
- *Q 13 - How to evaluate trade-offs in MSP and MPA designation process?*
- *Q 14 - How to assess compatibility of maritime uses and MPA conservation objectives? How to prioritize uses?*
- *Q 26 - How to take OECM into consideration in MSP where no legal instruments are in place?*
- *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
- *Q 34 - How to achieve the strict protection area target of 10% by 2030 in marine areas?*
- *Q 45 - How to assess economic impacts of conservation measures?*
- *Q 46 - Hot to identify compensation measures and how to assess their effectiveness?*
- *Q 54 - How to anticipate and address climate change within MPA?*
- *Q 61 - How can reliability/accuracy of the spatial data for MPA identification be improved?*
- *Q 63 - How to deal with knowledge gaps on socio-economic data, including the spatial dimension?*
- *Q 64 - How to deal with knowledge gaps on impacts of maritime activities, including cumulative impacts?*

Description

Guidelines for applying trade-off methodology for MPA Design to be described here.

Source Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

Edit online (for developers only)

13.1.5 Trait-based Vulnerability Assessment

Related questions

- *Q 10 - How to protect marine mammals?*
- *Q 14 - How to assess compatibility of maritime uses and MPA conservation objectives? How to prioritize uses?*
- *Q 18 - How to identify priority areas for preserving/restoring reef-forming species such as oysters Lanice conchilega or mussels?*
- *Q 39 - What criteria are available to assess sustainability of maritime uses?*
- *Q 41 - What are the main objectives and elements of monitoring programs for MPAs?*
- *Q 56 - How to anticipate changes in biotopes due to climate change?*
- *Q 65 - How can we assess CC impacts on fishing stocks (e.g. cod and sprat) and develop strategies to protect these species across different life stages (e.g. focusing on nurseries and fishing grounds)?*

Description

Vulnerability assessment represents a function of both intrinsic and extrinsic factors and assessments often considering exposure, sensitivity and adaptability in combination (Pacifici et al., 2015). In fact, the vulnerability function will make the link between the Exposure score, the Sensitivity matrix and, eventually, the Adaptivity/Desirability matrix.

Notes Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

13.1.6 Data sharing

Child operational approaches

- *GFW - Global Fishing Watch*
- *EMODnet*

Related questions

- *Q 34 - How to achieve the strict protection area target of 10% by 2030 in marine areas?*
- *Q 63 - How to deal with knowledge gaps on socio-economic data, including the spatial dimension?*
- *Q 63 - How to deal with knowledge gaps on socio-economic data, including the spatial dimension?*
- *Q 64 - How to deal with knowledge gaps on impacts of maritime activities, including cumulative impacts?*

Edit online (for developers only)

13.2 Methods

13.2.1 Trade-off for MPA Design - Conservation and economic development

Parent operational approaches

- *Trade-off for MPA Design*

Related questions

- *Q 17 - How to identify priority areas for conservation of pelagic biodiversity?*
- *Q 18 - How to identify priority areas for preserving/restoring reef-forming species such as oysters Lanice conchilega or mussels?*
- *Q 25 - How to integrate the process of MPA designation or extension in MSP?*
- *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
- *Q 45 - How to assess economic impacts of conservation measures?*
- *Q 46 - Hot to identify compensation measures and how to assess their effectiveness?*

Description

Trade-off for MPA Design

Guidelines for applying trade-off methodology for MPA Design to be described here.

Source Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

Trade-off for MPA Design - Conservation and economic development

Definition: balance the need to protect marine ecosystems, maintaining ecological integrity while supporting economic activities such as fishing, shipping, and tourism Example: designating marine protected areas (MPAs) can limit economic opportunities for fishing and tourism industries

Source Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

Edit online (for developers only)

13.2.2 Trade-off for MPA Design - Short-term and long-term benefits

Parent operational approaches

- *Trade-off for MPA Design*

Related questions

- *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
- *Q 46 - Hot to identify compensation measures and how to assess their effectiveness?*

Description

Trade-off for MPA Design

Guidelines for applying trade-off methodology for MPA Design to be described here.

Source Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

Trade-off for MPA Design - Short-term and long-term benefits

Definition: balance the immediate economic benefits of certain activities with the long-term benefits of protecting marine ecosystems. Example: allowing oil and gas exploration and drilling can provide short-term economic benefits but can also have long-term negative impacts on the environment and marine life.

Source Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

Edit online (for developers only)

13.2.3 Trade-off for MPA Design - Exclusives uses and shared uses

Parent operational approaches

- *Trade-off for MPA Design*

Related questions

- *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
- *Q 46 - Hot to identify compensation measures and how to assess their effectiveness?*

Description

Trade-off for MPA Design

Guidelines for applying trade-off methodology for MPA Design to be described here.

Source Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

Trade-off for MPA Design - Exclusives uses and shared uses

Definition: when decisions about the allocation of marine space may involve trade-offs between exclusive use for a specific activity or multiple shared uses Example: Requires considering different stakeholder interests for that area and balancing between various uses, like fishing, marine protected areas, recreational zones, shipping lanes, etc.

Source Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

Edit online (for developers only)

13.2.4 Trade-off for MPA Design - Specific stakeholder interests

Parent operational approaches

- *Trade-off for MPA Design*

Related questions

- *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
- *Q 45 - How to assess economic impacts of conservation measures?*
- *Q 46 - Hot to identify compensation measures and how to assess their effectiveness?*

Description

Trade-off for MPA Design

Guidelines for applying trade-off methodology for MPA Design to be described here.

Source Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

Trade-off for MPA Design - Specific stakeholder interests

Definition: the various stakeholders may have different priorities and objectives compromises have to be made to take account of the various perspectives Example: To advocate the interests of commercial fishermen, local communities, conservation organisations, researchers, maritime tour operators, and non-governmental organisations.

Source Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

Edit online (for developers only)

13.2.5 Trade-off for MPA Design - Local and global interests

Parent operational approaches

- *Trade-off for MPA Design*

Related questions

- *Q 17 - How to identify priority areas for conservation of pelagic biodiversity?*
- *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
- *Q 46 - Hot to identify compensation measures and how to assess their effectiveness?*

Description

Trade-off for MPA Design

Guidelines for applying trade-off methodology for MPA Design to be described here.

Source Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

Trade-off for MPA Design - Local and global interests

Definition: While MSP can benefit local communities through economic development and job creation, it must also consider the impact of human activities on the global ocean ecosystem Example: overfishing in one region can negatively impact fish populations in other regions

Source Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

Edit online (for developers only)

13.2.6 Participatory mapping

Parent operational approaches

- *Trade-off for MPA Design*

Related questions

- *Q 8 - How to identify and analyze the main conflict area that may arise if we need to expand marine protected areas in response to sensitive habitats, ecological connectivity or other valuable ecological as*
- *Q 11 - How to integrate socio-econonomic objectives in assessment of existing MPA (network) and identification of new MPAs?*
- *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*
- *Q 13 - How to evaluate trade-offs in MSP and MPA designation process?*
- *Q 14 - How to assess compatibility of maritime uses and MPA conservation objectives? How to prioritize uses?*
- *Q 26 - How to take OECM into consideration in MSP where no legal instruments are in place?*
- *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
- *Q 34 - How to achieve the strict protection area target of 10% by 2030 in marine areas?*
- *Q 45 - How to assess economic impacts of conservation measures?*
- *Q 46 - Hot to identify compensation measures and how to assess their effectiveness?*
- *Q 54 - How to anticipate and address climate change within MPA?*
- *Q 61 - How can reliability/accuracy of the spatial data for MPA identification be improved?*
- *Q 63 - How to deal with knowledge gaps on socio-economic data, including the spatial dimension?*
- *Q 64 - How to deal with knowledge gaps on impacts of maritime activities, including cumulative impacts?*

Description

Trade-off for MPA Design

Guidelines for applying trade-off methodology for MPA Design to be described here.

Source Gutierrez D., Calado H., De Bruyn A., et al., (2024). Trade-offs method for protection and restoration in MSP – ESE3 (Deliverable – D4.3., under the WP4 of MSP4BIO project (GA n° 101060707)).

Participatory mapping

Technological advances, including those related to mapping, have progressed further in terrestrial regions than marine ones. Combining spatial data collected through participatory mapping methods with ecological data is valuable for understanding the marine environment (Seijo et al., 2021). This approach enables the identification of priority management areas, facilitates the assessment of the alignment of mapped values with planning proposals, and provides tangible evidence of conflicts among specific stakeholder groups (Seijo et al., 2021).

Participatory mapping is pivotal in MSP, particularly Marine Protected Areas (MPA), because it fosters robust stakeholder engagement (Seijo et al., 2021). This inclusive approach empowers local communities and stakeholders to actively share their insights, values, and preferences, enriching the planning and management processes (Loerzel et al., 2017). Through collaborative map-based exercises, participants can pinpoint areas of high ecological or cultural significance, identify potential conflicts,and collectively envision sustainable solutions. These mapped insights provide the foundation for constructing scenarios reflecting various trade-offs and synergies among land uses and marine activities. The engagement of stakeholders not only enhances the effectiveness of MSP and MPA initiatives but also promotes local understanding, support, and legitimacy.

The development of scenarios, driven by participatory mapping, provides a structured framework to assess potential impacts, balance conflicting objectives, and make informed decisions that prioritise sustainable resource management (Calado et al., 2021). This integration of stakeholder input ensures that the resulting scenarios are accurate and align with the diverse values and priorities of the local communities involved. By actively involving stakeholders in mapping exercises, diverse perspectives and local knowledge are incorporated, enriching the scenario-creation process. By incorporating diverse perspectives, participatory mapping becomes a powerful tool for creating more inclusive and sustainable marine resource management strategies (Loerzel et al., 2017).

Through participatory mapping, resource managers can gain improved decision-making capabilities to assess whether to monitor marine quality, implement measures to mitigate or reduce threats, initiate restoration activities, or strategically redirect management efforts to alternative areas (Loerzel et al., 2017). By including climate change perception, it is possible to get some impressions on the area and support leaders on decisions for adaptive management.

Integrating participatory mapping into MSP facilitates a comprehensive understanding and representation of Ecosystem Services. Local knowledge and preferences related to cultural, provisioning, regulating, and supporting services are captured spatially by engaging stakeholders in mapping exercises. This participatory approach identifies key areas of ecological and social significance and visualises trade-offs and synergies among services. The spatial representation of ES through participatory mapping becomes a crucial tool for decision-makers, allowing them to align conservation and development goals with the sustainable use of marine resources. The collaborative mapping process ensures that the diverse perspectives of stakeholders are considered, promoting a holistic and inclusive approach to managing marine ecosystems and their associated services within the MSP framework.

Edit online (for developers only)

13.3 Tools

13.3.1 Pressure assessment of MARine activities (PMAR) module

Parent operational approaches

- *Dispersion and connectivity modelling*

Related questions

- *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*
- *Q 17 - How to identify priority areas for conservation of pelagic biodiversity?*
- *Q 18 - How to identify priority areas for preserving/restoring reef-forming species such as oysters Lanice conchilega or mussels?*

Description

Dispersion and connectivity modelling

Tools incorporating connectivity through the explicit consideration of dispersion (active and passive) and migration processes (functional connectivity) and seascape features that facilitate or prevent the movement of organisms (structural connectivity) are still rare.

Currently, Zonation 5 and PlanWise4Blue are able to consider connectivity in their prioritization algorithms. This is mainly done through the consideration of structural aspects of habitats that facilitate the movement of species (habitat cohesion and integrity, corridors) when prioritizing different conservation strategies.

Functional connectivity, i.e., the actual movement of organisms, has not been explicitly and effectively incorporated in the assessed tools. The difficulties to generate reliable data (thing that has been changing in the last decade with the improvement of tracking technologies and methods for the analysis of genetic and chemical markers) and the computational demands of algorithms used to model different connectivity processes have prevented the effective consideration of functional connectivity in decision-making processes. However, a recent academic exercise using Symphony has shown how to incorporate information on larval dispersion derived from a Lagrangian particle-tracking model in a CEA (Jonsson et al., 2021).

Notes Source: Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Pressure assessment of MARine activities (PMAR) module

The Pressure assessment of MARine activities (PMAR) module is both a stand-alone tool and an operational integration to the Tools4MSP CEA framework. The CEA module relies on pressure-specific models, which may not always be available or comprehensive. To overcome this challenge, the PMAR approach uses Lagrangian particle tracking algorithms to produce intermediate-quality models that simulate the spread of certain anthropogenic pressures. This enhancement expands the versatility of the CEA tool, allowing for the consideration of a wider range of use, pressure, and receptor combinations. Furthermore, it introduces an innovative approach for exploring potential future scenarios. PMAR requires two types of input: oceanographic and atmospheric data to drive particle dispersal and trajectory calculations using OpenDrift (as described by Dagestad et al., 2018), and georeferenced layers of human activities, which act as the origins of pressure propagation. Oceanographic and atmospheric data can be directly streamed from well-known open-source European data infrastructures, including the Copernicus Marine Data Store. PMAR generates georeferenced layers that illustrate the spread of pressures from specified human activities within the area of interest. These layers can be directly analysed to study the pressures or integrated into the CEA module for a comprehensive evaluation of cumulative effects. PMAR standardises input layers by defining the area of interest and implementing a uniform grid system. It enables customisation of the pressure model by adjusting parameters that define the physical properties of the virtual particles, such as buoyancy or decay rate. To reduce the impact of seasonal or annual variations in ocean currents or wind patterns, it combines results from multiple simulations conducted over various time frames. PMAR is a tool designed to assist with marine management and decision-making processes, specifically tailored to MSP. It includes features such as trajectory aggregation methods (allowing the output layer to display either average or maximum trajectory concentrations within the area), the ability to prioritize different human activity layers through weighting, and the option to focus on a specific subsection of the spatial domain. The software's enhanced capabilities also include a vertical dimension for conducting 3D simulations. This allows for the examination of phenomena such as particle sinking, sedimentation, and distribution within the water column. Additionally, the tool enables the addition of various particle types, including oil from spills. It also provides the functionality to filter particles based on their 'status', whether they are in active transport or have ceased movement due to beaching or sinking. PMAR is fully integrated and operational on the Tools4MSP Geoplatform. Users can create a PMAR case study, select a specific domain region, upload necessary human activity layers, adjust particle characteristics, and initiate the simulation. The generated output can be downloaded as a geotiff file, incorporated into the Geoplatform's layer database, or added to a map interface for dynamic exploration and analysis.

Notes Source: Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

13.3.2 Tools4MSP CEA

Parent operational approaches

- *Cumulative Effects Assessment (CEA)*

Related questions

- *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*
- *Q 64 - How to deal with knowledge gaps on impacts of maritime activities, including cumulative impacts?*

Description

Cumulative Effects Assessment (CEA)

CEA is the process of systematically analysing and assessing cumulative environmental change. The purpose of CEA is to ensure that the full range of consequences of actions is considered.

Cumulative impacts can occur over different temporal and spatial scales by interacting, combining and compounding so that the overall effect often exceeds the simple sum of previous effects.

The spatial scale can be local, regional or global, whilst the frequency or temporal scale includes past, present and future impacts on a specific environment or region. Cumulative effects can simply be defined as the total impact that a series of developments, either present, past or future, will have on the environment within a specific region over a particular period of time.

Notes Source: DEAT (2004) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

Tools4MSP CEA

The Tools4MSP Geoplatform is a system built on the GeoNode open-source software, which helps people work together on managing location-based information.

the Geoplatform also incorporates the Tools4MSP modelling framework. This framework is an extensive and unified approach crafted to assist in MSP processes. Tailored for decision-makers, planners, and stakeholders engaged in marine environment management, it provides an organized structure and a set of tools.

Within the Tools4MSP framework, a specialized module addresses a spatially explicit CEA. Originating from the methodology by Halpern et al. (2008) and subsequently refined by Andersen et al. (2015), Tools4MSP CEA aims to spatially evaluate the impact of individual or multiple human activities on environmental components. It achieves this by explicitly identifying relationships among the source of pressure, pathways of exposure, and the environmental receptors that may be affected. This structured approach, known as source-pressure-pathway-receptor linkages or an impact chain, aligns with key aspects of environmental risk assessment methodologies (Judd et al., 2015; Stelzenmüller et al., 2018).

Functioning primarily as a modelling framework, Tools4MSP provides a standardized structure for the CEA process. It identifies relationships between relevant concepts and outlines a systematic method for combining and interpreting results from multiple models. In summary, the impact chains are modelled through two distinct but interconnected tasks, namely pressures assessment and effects/impacts assessment.

The framework offers flexibility in integrating various pressure models, but it is crucial to prioritize models that establish a connection, including spatial relationships, between the pressure and the corresponding human activity causing it. The Tools4MSP framework employs two models for pressure estimation: • Isotropic Convolution Model: This serves as the basic model, applied by default when more accurate models are not applicable. It utilizes the spatial distribution of anthropogenic uses in the study area and pressure weights as input parame-ters. • Pressure Assessment of MARine Activities (PMAR) Model: This model employs Lagrangian particle tracking algorithms to generate mid-quality representations of how pressures from human activities spread.

Notes Source: Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

13.3.3 HELCOM SPIA Tool

Parent operational approaches

- *Cumulative Effects Assessment (CEA)*

Related questions

- *Q 24 - How do MPA policies intersect with MSP?*
- *Q 64 - How to deal with knowledge gaps on impacts of maritime activities, including cumulative impacts?*

Related applications

- *Application of the HELCOM SPIA Tool for HELCOM MPAs*

Description

Cumulative Effects Assessment (CEA)

CEA is the process of systematically analysing and assessing cumulative environmental change. The purpose of CEA is to ensure that the full range of consequences of actions is considered.

Cumulative impacts can occur over different temporal and spatial scales by interacting, combining and compounding so that the overall effect often exceeds the simple sum of previous effects.

The spatial scale can be local, regional or global, whilst the frequency or temporal scale includes past, present and future impacts on a specific environment or region. Cumulative effects can simply be defined as the total impact that a series of developments, either present, past or future, will have on the environment within a specific region over a particular period of time.

Notes Source: DEAT (2004) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

HELCOM SPIA Tool

HELCOM SPIA tool enables the computation of spatial pressure and impact assessments utilizing the data layers employed in the HELCOM third holistic assessment (HOLAS 3) of the Baltic Sea. These data layers consist of 17 aggregated pressure layers and 57 ecosystem component layers. Users can perform pressure or impact calculations by utilizing all available data layers or by selecting specific combinations of layers.

The tool employs sensitivity scores derived from the HOLAS 3 SPIA assessment but also permits users to make edits to these scores. Within the tool, users can explore the available pressure and ecosystem component layers in the map viewer, access metadata descriptions, and modify sensitivity scores. Additionally, users can run pressure and impact calculations using input data and sensitivity scores of their choice, examine the results in the map viewer, including insights into the contribution of human activities, pressures, and ecosystem components to the impact, and download the result raster and statistics matrix. The tool encompasses the Spatial Impact Index (SII), which assesses the spatial distribution of cumulative effects in the Baltic Sea, taking into account sensitivity scores for pressure-ecosystem combinations.

The Baltic Sea Impact Index (BSII) quantifies holistic impact across all layers. The Spatial Pressure Index (SPI) calculates cumulative pressures from human activities in the Baltic Sea, leveraging aggregated pressure layers weighted by ecosystem component sensitivity scores to prevent overestimation of widespread, low-effect pressures. The Baltic Sea Pressure Index (BSPI) assesses cumulative pressure across all aggregated pressure layers.

Both the SII and SPI adhere to the concepts introduced by Halpern et al. (2008), calculating the sum of pressures or impacts in 1x1 km assessment units.

Notes https://maps.helcom.fi/website/bsii/

Edit online (for developers only)

13.3.4 PlanWise4Blue

Parent operational approaches

- *Cumulative Effects Assessment (CEA)*

Related questions

- *Q 64 - How to deal with knowledge gaps on impacts of maritime activities, including cumulative impacts?*

Description

Cumulative Effects Assessment (CEA)

CEA is the process of systematically analysing and assessing cumulative environmental change. The purpose of CEA is to ensure that the full range of consequences of actions is considered.

Cumulative impacts can occur over different temporal and spatial scales by interacting, combining and compounding so that the overall effect often exceeds the simple sum of previous effects.

The spatial scale can be local, regional or global, whilst the frequency or temporal scale includes past, present and future impacts on a specific environment or region. Cumulative effects can simply be defined as the total impact that a series of developments, either present, past or future, will have on the environment within a specific region over a particular period of time.

Notes Source: DEAT (2004) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

PlanWise4Blue

The PlanWise4Blue (PW4B) platform, accessible at https://gis.sea.ee/bluebiosites/, is a collaborative initiative led by the Department of Marine Systems at the Estonian Marine Institute, University of Tartu. This innovative decision support system was born out of a critical need to bridge the gap between scientific research and policymaking. It aims to facilitate the sustainable development of marine areas and the formulation of effective conservation strategies for European seas, particularly in the context of rapid human-induced environmental change. The platform is dynamic, constantly expanding in geographical scope and incorporating different natural values, human impacts and analytical tools.

The PW4B portal is developed using ASP.NET MVC architecture, PostgreSQL database engine for data management, and ESRI ArcGIS API for JavaScript for geospatial data visualization and mapping. The PW4B technology ensures full responsiveness and accessibility across various devices, including smartphones, tablets, and computers, regardless of the operating system used (Windows, iOS, or Android). The development approach of PW4B is characterised by the use of the Single Page Application (SPA) model, which enables dynamic user interaction with the portal's controls, data, and elements within a single webpage, eliminating the need for page reloads after each action. This approach improves the user experience by enabling seamless navigation and interaction within the portal. The backend of PW4B uses PL/pgSQL Procedural Language to create and manage conditional and impact matrix tables, which are essential to the tool's ability to process and present data. Python programming language is used to analyse data, generate various human pressure combinations, and calculate the cumulative effects of different pressures on natural assets. The PW4B system architecture comprises server and client/user interface components. GIS data is prepared, analysed, and stored in a geodatabase using ArcGIS Desktop and Python scripts on the server side. A rcGIS Server enables the sharing of GIS data through Web Map Services (WMS) and the execution of Geoprocessing tool Services. Additionally, the PostgreSQL database is used to store and manage auxiliary tables such as conditional and impact matrix tables, WMS layer information, model parameters, and user interface configurations using PL/pgSQL.

The ESRI ArcGIS API for JavaScript is used on the client side to visualize WMS layers and support interactive map creation.

Users can overlay multiple layers, query feature information, and engage with the portal to set model parameters, execute geoprocessing services, and view the results. The PW4B portal facilitates the organization and management of geospatial data, ensuring interoperability. It serves as a versatile platform for creating customized scenarios, running diverse analyses, and supporting sustainable marine spatial planning

Source Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

13.3.5 CC Analog Base Velocities

Parent operational approaches

- *Climate change impact assessment*

Related questions

- *Q 41 - What are the main objectives and elements of monitoring programs for MPAs?*
- *Q 55 - How to anticipate and address climate change within a MPA network?*
- *Q 56 - How to anticipate changes in biotopes due to climate change?*
- *Q 65 - How can we assess CC impacts on fishing stocks (e.g. cod and sprat) and develop strategies to protect these species across different life stages (e.g. focusing on nurseries and fishing grounds)?*

Description

Climate change impact assessment

Different tools have already or are in the processes of incorporating applications for the analysis of the effects of climate change on relevant natures values. A promising development in the frame of the MSP4BIO is a prototype for the use of analog-based climate velocity for climate adaptation planning withing the Tools4MSP geoplatform.

Notes Source: Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

CC Analog Base Velocities

Tools4MSP infrastructure provides a tool for the calculation of analog-based velocities, a crucial metric for effective adaptation planning in the face of climate change.

Carroll et al. (2015) provided seminal insights into the identification of areas vulnerable to climate change through the concept of Biotic and Climatic Velocity. This framework emphasizes the contrasting vulnerabilities of different ecosystems and regions based on the rate at which they are expected to experience changes in climatic conditions.

the tool employs a nearest-neighbour approach to identify climatically analogous sites, focusing on the entire Mediterranean basin as the focal region. The tool calculates the analog-based velocities by determining the actual distance, in kilometres per year, between two climatically similar locations. Both forward and backward velocities are computed for each site (grid cell). The forward velocity measures the rate at which one must transition from a location with current climatic conditions to the closest site projected to exhibit similar conditions in the future. Elevated forward velocities signal a notable risk to species, suggesting potential challenges in adapting to swiftly evolving environmental circumstances. In contrast, the backward velocity gauges the pace required to revert to a site with anticipated future climatic conditions, originating from the nearest location currently sharing the same climatic conditions. Higher backward velocities indicate potential risks to the stability of the site.

Notes The steps to calculate analog-based velocities, as illustrated in Figure 4.7, are outlined as follows:

1. Define Analysis Area: The first step involves delineating the analysis area, pref-erably as a closed basin such as the Mediterranean, to mitigate edge effects.
2. Cell Division: The analysis area is then subdivided into regular cells to facilitate calculations.
3. Bioclimatic Variables Calculation: Bioclimatic variables, acting as predictors, are computed for both current conditions and future projections within each cell. In the example provided, these variables were derived for two 25-year periods (2006–2030) and (2031–2055), although standard climate periods typically span 30 years.

The dataset utilized includes nine bioclimatic variables related to Sea Surface Temperature (SST), specifically: a. Annual Mean Temperature b. Annual Mean Diurnal Range c. Isothermality d. Temperature Seasonality e. Max Temperature of Warmest Month f. Min Temperature of Coldest Month g. Annual Temperature Range h. Mean Temperature of Warmest Quarter i. Mean Temperature of Coldest Quarter

4. PCA: A PCA is automatically conducted on the combined space of the nine bio-climatic variables, considering both present and future conditions.
5. Distance Matrix Calculation: Two distance matrices are computed: one pertaining to cells closest to current climatic conditions (for forward velocity) and another for cells nearest to future climatic conditions (for backward velocity).

6. Introduction of Thresholds: Thresholds are introduced with respect to the climatic distances on the PCA space to ascertain similar climatic conditions.

7. Velocity Maps Calculation: Subsequently, maps corresponding to forward veloci-ties and backward velocities are generated.

Source: Kotta et al. (2024) Ecological toolkit (ESE1) for MPAs prioritization and networking. Deliverable – D3.4., under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

13.3.6 GFW - Global Fishing Watch

Parent operational approaches

- *Data sharing*

Related questions

- *Q 63 - How to deal with knowledge gaps on socio-economic data, including the spatial dimension?*

Description

Data sharing

GFW - Global Fishing Watch

Global Fishing Watch (GFW) is an open-access platform that uses satellite data to track fishing activity worldwide. By analyzing signals from Automatic Identification Systems (AIS) and Vessel Monitoring Systems (VMS), it provides insights into where and when fishing occurs, helping to improve the management of marine resources.

For Marine Protected Areas (MPAs), GFW can be particularly useful in several ways. It allows researchers and policymakers to monitor fishing activity within and around MPAs, helping to identify cases where vessels might be operating in restricted zones. This kind of transparency can support better enforcement and compliance with conservation regulations.

GFW is also valuable for evaluating the effectiveness of MPAs over time. By comparing fishing activity before and after an area is designated as protected, it becomes easier to assess whether restrictions are being respected and if the MPA is achieving its conservation goals.

Additionally, the platform can support stakeholder engagement, offering accessible data that communities, NGOs, and decision-makers can use to discuss the impacts of MPAs on fisheries and local economies. While GFW doesn't replace on-the-ground enforcement or local knowledge, it adds an important layer of information that can contribute to more informed and adaptive marine management.

Source GFW Home Page: https://globalfishingwatch.org/

Edit online (for developers only)

13.3.7 EMODnet

Parent operational approaches

- *Data sharing*

Related questions

- *Q 63 - How to deal with knowledge gaps on socio-economic data, including the spatial dimension?*
- *Q 64 - How to deal with knowledge gaps on impacts of maritime activities, including cumulative impacts?*

Description

Data sharing

EMODnet

The European Marine Observation and Data Network (EMODnet) is a key initiative of the European Union that provides open access to high-quality marine data, products, and services. It is designed to support marine knowledge, policy-making, and sustainable blue economy development by integrating and harmonizing data from various sources across Europe.

EMODnet operates through a network of thematic portals covering bathymetry, geology, seabed habitats, chemistry, biology, physics, human activities, and data ingestion. These portals aggregate, standardize, and distribute marine data collected by research institutions, governmental agencies, and private entities, ensuring interoperability and accessibility.

One of EMODnet's primary strengths is its role in Maritime Spatial Planning (MSP) and Digital Twin of the Ocean (DTO) initiatives, providing essential datasets for environmental assessments, marine conservation, and policy decision-making. The platform also supports cumulative impact analysis, climate change monitoring, and ecosystem-based management.

By offering user-friendly data visualization tools, APIs, and web services, EMODnet facilitates seamless integration into scientific research, industry applications, and governance frameworks. Its commitment to FAIR (Findable, Accessible, Interoperable, Reusable) data principles ensures that marine knowledge is effectively leveraged to address global ocean challenges.

Source EMODnet Home Page: https://emodnet.ec.europa.eu/

EMODnet Map Viewer: https://emodnet.ec.europa.eu/geoviewer/

Edit online (for developers only)

CHAPTER

FOURTEEN

MSP DATA FRAMEWORK

14.1 MSPdF Data Clusters

14.1.1 Marine & Coastal Environment

MSPdF Data Clusters

Description

Information on coastal and marine environments to evaluate sustainability of the maritime activities. E.g., ecological and ecosystems' characteristics, state of the environment, ecosystems' carrying capacity, pressure of the maritime activities. As outlined in the MSP, environmental cluster data can be classified according to MSFD and/or WFD classifications, where applicable. Beside the hierarchical MSFD classification, an additional attribute can be associated with the data, namely Descriptor and/or Criteria.

A non-MSFD classification, not foreseen in the MSPdF, has been added for those data that cannot clearly be associated with the MSFD classification, such as emerged coastal habitats, non-seabirds, seamounts, etc.

Ecosystem

MSFD - Level 1

Parent

- *Marine & Coastal Environment*

Species

MSFD - Level 2

Parent

- *Ecosystem*

Marine birds

MSFD - Level 3

Parent

- *Species*

Edit online (for developers only)

Mammals

MSFD - Level 3

Parent

- *Species*

Edit online (for developers only)

Fish

MSFD - Level 3

Parent

- *Species*

Edit online (for developers only)

Cephalopods

MSFD - Level 3

Parent

- *Species*

Edit online (for developers only)

Reptiles

MSFD - Level 3

Parent

- *Species*

Turtle

MSFD - Feature

Parent

- *Reptiles*

Caretta caretta

MSFD - Species

Parent

- *Turtle*

Edit online (for developers only)

Edit online (for developers only)

Edit online (for developers only)

Edit online (for developers only)

Habitat

MSFD - Level 2

Parent

- *Ecosystem*

Water column

MSFD - Level 3

Parent

- *Habitat*

Edit online (for developers only)

Seabed

MSFD - Level 3

Parent

- *Habitat*

Edit online (for developers only)

Edit online (for developers only)

Ecosystems, including food webs

MSFD - Level 2

Parent

- *Ecosystem*

Physical and hydrological characteristics

MSFD - Level 3

Parent

- *Ecosystems, including food webs*

Edit online (for developers only)

Chemical characteristics

MSFD - Level 3

Parent

- *Ecosystems, including food webs*

Edit online (for developers only)

Biological characteristics

MSFD - Level 3

Parent

- *Ecosystems, including food webs*

Edit online (for developers only)

Functions and processes

MSFD - Level 3

Parent

- *Ecosystems, including food webs*

Edit online (for developers only)

Edit online (for developers only)

Edit online (for developers only)

Pressure

MSFD - Level 1

Parent

- *Marine & Coastal Environment*

Biological

MSFD - Level 2

Parent

- *Pressure*

Input or spread of non-indigenous species

MSFD - Level 3

Parent

- *Biological*

Edit online (for developers only)

Input of microbial pathogens

MSFD - Level 3

Parent

- *Biological*

Edit online (for developers only)

Input of genetically modified species and translocation of native species

MSFD - Level 3

Parent

- *Biological*

Edit online (for developers only)

Disturbance of species due to human presence

MSFD - Level 3

Parent

- *Biological*

Edit online (for developers only)

Extraction of, or mortality/injury to, wild species

MSFD - Level 3

Parent

- *Biological*

Edit online (for developers only)

Edit online (for developers only)

Physical

MSFD - Level 2

Parent

- *Pressure*

Physical disturbance to seabed

MSFD - Level 3

Parent

- *Physical*

Edit online (for developers only)

Physical loss

MSFD - Level 3

Parent

- *Physical*

Edit online (for developers only)

Changes to hydrological conditions

MSFD - Level 3

Parent

- *Physical*

Edit online (for developers only)

Edit online (for developers only)

Substances, litter and energy

MSFD - Level 2

Parent

- *Pressure*

Input of nutrients - diffuse sources, point sources, atmospheric deposition

MSFD - Level 3

Parent

- *Substances, litter and energy*

Edit online (for developers only)

Input of organic matter - diffuse sources and point sources

MSFD - Level 3

Parent

- *Substances, litter and energy*

Edit online (for developers only)

Input of other substances - diffuse sources, point sources, atmospheric deposition, acute events

MSFD - Level 3

Parent

- *Substances, litter and energy*

Edit online (for developers only)

Input of litter

MSFD - Level 3

Parent

- *Substances, litter and energy*

Edit online (for developers only)

Input of anthropogenic sound

MSFD - Level 3

Parent

- *Substances, litter and energy*

Edit online (for developers only)

Input of other forms of energy

MSFD - Level 3

Parent

- *Substances, litter and energy*

Edit online (for developers only)

Input of water - point sources

MSFD - Level 3

Parent

- *Substances, litter and energy*

Edit online (for developers only)

Edit online (for developers only)

Edit online (for developers only)

Descriptor/Criteria

MSFD - Descriptors/Criteria

Parent

- *Marine & Coastal Environment*

D1 Biodiversity - birds

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D1 Biodiversity - mammals

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D1 Biodiversity - reptiles

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D1 Biodiversity - fish

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D1 Biodiversity - cephalopods

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D1 Biodiversity - pelagic habitats

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D2 Non-indigenous species

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D3 Commercial fish and shellfish

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D4 Food webs/D1 Biodiversity - ecosystems

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D5 Eutrophication

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D6 Sea-floor integrity/D1 Biodiversity - benthic habitats

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D7 Hydrographical changes

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D8 Contaminants

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D9 Contaminants in seafood

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D10 Marine litter

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D11 Energy, including underwater noise

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D1C1 Mortality rate from incidental by-catch

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D1C2 Population abundance

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D1C3 Population demographic characteristics

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D1C4 Population distributional range and pattern

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D1C5 Habitat for the species

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D1C6 Pelagic habitat condition

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D2C1 Newly-introduced NIS

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D2C2 Established NIS

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D2C3 Adverse effects of NIS

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D3C1 Fishing mortality rate (F)

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D3C2 Spawning stock biomass (SSB)

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D3C3 Population age/size distribution

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D4C1 Trophic guild species diversity

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D4C2 Abundance across trophic guilds

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D4C3 Trophic guild size distribution

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D4C4 Trophic guild productivity

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D5C1 Nutrient concentrations

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D5C2 Chlorophyll-a concentration

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D5C3 Harmful algal blooms

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D5C4 Photic limit

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D5C5 Dissolved oxygen concentration

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D5C6 Opportunistic macroalgae of benthic habitats

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D5C7 Macrophyte communities of benthic habitats

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D5C8 Macrofaunal communities of benthic habitats

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D6C1 Physical loss of the seabed

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D6C2 Physical disturbance to the seabed

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D6C3 Adverse effects from physical disturbance

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D6C4 Benthic habitat extent

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D6C5 Benthic habitat condition

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D7C1 Permanent alteration of hydrographical conditions

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D7C2 Adverse effects from permanent alteration of hydrographical conditions

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D8C1 Contaminant in environment

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D8C2 Adverse effects of contaminants

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D8C3 Significant acute pollution events

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D8C4 Adverse effects of significant acute pollution events

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D9C1 Contaminants in seafood

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D10C1 Litter (excluding micro-litter)

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D10C2 Micro-litter

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D10C3 Litter ingested

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D10C4 Adverse effects of litter

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D11C1 Anthropogenic impulsive sound

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

D11C2 Anthropogenic continuous low-frequency sound

MSFD - Descriptors/Criteria

Parent

- *Descriptor/Criteria*

Edit online (for developers only)

Edit online (for developers only)

Species

Non MSFD Classes

Parent

- *Marine & Coastal Environment*

Edit online (for developers only)

Habitats

Non MSFD Classes

Parent

- *Marine & Coastal Environment*

Edit online (for developers only)

Physiography & Geology

Non MSFD Classes

Parent

- *Marine & Coastal Environment*

Edit online (for developers only)

Pressures

Non MSFD Classes

Parent

- *Marine & Coastal Environment*

Edit online (for developers only)

Ecological status

WFD

Parent

- *Marine & Coastal Environment*

Edit online (for developers only)

Chemical status

WFD

Parent

- *Marine & Coastal Environment*

Edit online (for developers only)

Edit online (for developers only)

14.1.2 Oceanographic and Climate Change

MSPdF Data Clusters

Description

Oceanographic and climatic characteristics, including various physical and chemical parameters such as sea temperature, salinity, atmospheric pressure, bathymetry, winds, currents, waves, oxygen, nutrients, and dissolved organic carbon. These parameters play a crucial role in defining natural potential or constraints for maritime uses and activities, such as offshore wind farms, aquaculture, and wave energy. Monitoring oceanographic conditions is essential for understanding local climate, identifying trends, and assessing the impact of climate change on Maritime Spatial Planning (MSP), influencing both the natural potential and limiting factors within marine sectors.

Physics

Oceanographic and CC Theme

Parent

- *Oceanographic and Climate Change*

Sea state

Oceanographic and CC Variable

Parent

- *Physics*

Edit online (for developers only)

Ocean surface stress

Oceanographic and CC Variable

Parent

- *Physics*

Edit online (for developers only)

Bathymetry

Oceanographic and CC Variable

Parent

- *Physics*

Edit online (for developers only)

Sea ice

Oceanographic and CC Variable

Parent

- *Physics*

Edit online (for developers only)

Sea surface height

Oceanographic and CC Variable

Parent

- *Physics*

Edit online (for developers only)

Sea surface temperature

Oceanographic and CC Variable

Parent

- *Physics*

Edit online (for developers only)

Subsurface temperature

Oceanographic and CC Variable

Parent

- *Physics*

Edit online (for developers only)

Surface currents

Oceanographic and CC Variable

Parent

- *Physics*

Edit online (for developers only)

Subsurface currents

Oceanographic and CC Variable

Parent

- *Physics*

Edit online (for developers only)

Sea surface salinity

Oceanographic and CC Variable

Parent

- *Physics*

Edit online (for developers only)

Subsurface salinity

Oceanographic and CC Variable

Parent

- *Physics*

Edit online (for developers only)

Ocean surface heat flux

Oceanographic and CC Variable

Parent

- *Physics*

Edit online (for developers only)

Waves

Oceanographic and CC Variable

Parent

- *Physics*

Edit online (for developers only)

Edit online (for developers only)

Biochemistry

Oceanographic and CC Theme

Parent

- *Oceanographic and Climate Change*

Oxygen

Oceanographic and CC Variable

Parent

- *Biochemistry*

Edit online (for developers only)

Nutrients

Oceanographic and CC Variable

Parent

- *Biochemistry*

Edit online (for developers only)

Inorganic carbon

Oceanographic and CC Variable

Parent

- *Biochemistry*

Edit online (for developers only)

Transient tracers

Oceanographic and CC Variable

Parent

- *Biochemistry*

Edit online (for developers only)

Particulate matter

Oceanographic and CC Variable

Parent

- *Biochemistry*

Edit online (for developers only)

Ammonium

Oceanographic and CC Variable

Parent

- *Biochemistry*

Edit online (for developers only)

Nitrate

Oceanographic and CC Variable

Parent

- *Biochemistry*

Edit online (for developers only)

Stable carbon isotopes

Oceanographic and CC Variable

Parent

- *Biochemistry*

Edit online (for developers only)

Chlorophyll-a

Oceanographic and CC Variable

Parent

- *Biochemistry*

Edit online (for developers only)

Edit online (for developers only)

Edit online (for developers only)

14.1.3 Marine & Coastal Conservation and Designated sites

MSPdF Data Clusters

Description

Various coastal and marine protection, conservation and designated sites, ranging from the international to the national/local scale. Examples include Marine Protected Areas (MPAs) and Fishery Restricted Areas (FRA). Additionally, it incorporates designations related to non-standard conservation, such as potential Other Effective Area-Based Conservation Measures (OECM), as well as designations for safety, security, and risk control from natural and man-made hazards (e.g., collision risk areas, flooding risk areas). In the context of Maritime Spatial Planning (MSP), this information plays a crucial role in evaluating potential (in)compatibilities of specific current and future uses and activities with marine and coastal protected areas. It is also relevant for assessing (in)compatibilities with various conservation figures and designations within maritime sectors managed by MSP. Understanding the conservation objectives associated with each designated area is essential in this regard.

Internationally designated Protected Areas (marine and coastal)

Conservation Classes

Parent

- *Marine & Coastal Conservation and Designated sites*

Edit online (for developers only)

Regionally designated Protected Areas (marine and coastal)

Conservation Classes

Parent

- *Marine & Coastal Conservation and Designated sites*

Edit online (for developers only)

Nationally designated Protected Areas (marine and coastal)

Conservation Classes

Parent

- *Marine & Coastal Conservation and Designated sites*

Edit online (for developers only)

Potential Other Effective area-based Conservation Measures (OECMs)

Conservation Classes

Parent

- *Marine & Coastal Conservation and Designated sites*

Edit online (for developers only)

Recognised areas of protection/conservation value

Conservation Classes

Parent

- *Marine & Coastal Conservation and Designated sites*

Edit online (for developers only)

Yes

Zonation

Parent

- *Marine & Coastal Conservation and Designated sites*

Edit online (for developers only)

No

Zonation

Parent

- *Marine & Coastal Conservation and Designated sites*

Edit online (for developers only)

Edit online (for developers only)

14.1.4 Maritime Activities and MSP

MSPdF Data Clusters

Description

Distribution of maritime activities and MSP designated areas regarding for example fisheries, maritime transport, nautical activities, aquaculture, defence, renewable energy, mineral extraction, and maritime tourism to assess potential conflicts and synergies, and to assess pressure and impact on the environment. This data cluster also includes data such as suitability maps for various activities (e.g., aquaculture and wind farms), providing valuable support for future scenario building and planning purposes.

Aquaculture - Finfish

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Aquaculture - Shellfish

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Mining and quarrying - Oil & Gas

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Mining and quarrying - Dredging

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Mining and quarrying - Dumping

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Professional fishing

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Recreational fishing

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Energy production - Renewable energy

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Other industries - Desalination

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Cultural entertainment and recreational services - Nautical sports

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Cultural entertainment and recreational services - Beaches

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Cultural entertainment and recreational services - Coastal tourism

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Cultural entertainment and recreational services - Underwater cultural heritage

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Transport - Harbours

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Transport - Anchorage area

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Transport - Maritime traffic

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Transport - Transport trends

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Logistic and storage services - Offshore supply

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Utilities - Electricity gas and thermal power distribution services

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Utilities - Waste treatment

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Utilities - Water and sewage infrastructure

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Utilities - Submarine outfall

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Utilities - Submarine cables

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Coastal infrastructures - Coastal defence works

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Protected areas

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Military areas

Activity types

Parent

- *Maritime Activities and MSP*

Edit online (for developers only)

Edit online (for developers only)

14.1.5 Coastal & Land use and planning

MSPdF Data Clusters

Land use / Land cover - Soil sealing-area

Coastal & Land use and Planning Classes

Parent

- *Coastal & Land use and planning*

Edit online (for developers only)

Land use / Land cover - Soil sealing-trend

Coastal & Land use and Planning Classes

Parent

- *Coastal & Land use and planning*

Edit online (for developers only)

Land use / Land cover - Land cover - Corine Land Cover

Coastal & Land use and Planning Classes

Parent

- *Coastal & Land use and planning*

Edit online (for developers only)

Land use / Land cover - Land cover - High Resolution Layer

Coastal & Land use and Planning Classes

Parent

- *Coastal & Land use and planning*

Edit online (for developers only)

Land use / Land cover - Land cover - Coast characteristics

Coastal & Land use and Planning Classes

Parent

- *Coastal & Land use and planning*

Edit online (for developers only)

Land use / Land cover - LC/LU-Coastal Zone hotspot thematic mapping

Coastal & Land use and Planning Classes

Parent

- *Coastal & Land use and planning*

Edit online (for developers only)

Land use / Land cover - Coastline

Coastal & Land use and Planning Classes

Parent

- *Coastal & Land use and planning*

Edit online (for developers only)

Planning - Strategic - National (EU regulated)

Coastal & Land use and Planning Classes

Parent

- *Coastal & Land use and planning*

Edit online (for developers only)

Planning - Strategic - National (others)

Coastal & Land use and Planning Classes

Parent

- *Coastal & Land use and planning*

Edit online (for developers only)

Planning - Strategic - Subnational

Coastal & Land use and Planning Classes

Parent

- *Coastal & Land use and planning*

Edit online (for developers only)

Planning - Strategic - Local

Coastal & Land use and Planning Classes

Parent

- *Coastal & Land use and planning*

Edit online (for developers only)

Planning - Coordination - Sub-national

Coastal & Land use and Planning Classes

Parent

- *Coastal & Land use and planning*

Edit online (for developers only)

Planning - Operational-Sub-National

Coastal & Land use and Planning Classes

Parent

- *Coastal & Land use and planning*

Edit online (for developers only)

Planning - Operational-Local

Coastal & Land use and Planning Classes

Parent

- *Coastal & Land use and planning*

Edit online (for developers only)

Coastline - Geomorphology

Coastal & Land use and Planning Classes

Parent

- *Coastal & Land use and planning*

Edit online (for developers only)

Coastline - Trends

Coastal & Land use and Planning Classes

Parent

- *Coastal & Land use and planning*

Edit online (for developers only)

Edit online (for developers only)

14.1.6 Socio-economic

MSPdF Data Clusters

Fisheries and Aquaculture - Marine fishing - A0311

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Fisheries and Aquaculture - Marine aquaculture - A0321

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Fisheries and Aquaculture - Wholesale of other food, including fish, crustaceans and molluscs - G4638

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Fisheries and Aquaculture - Processing and preserving of fish, crustaceans and molluscs - C1020

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Extraction of oil and gas - Extraction of crude petroleum - B0610

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Extraction of oil and gas - Extraction of natural gas - B0620

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Extraction of oil and gas - Support activities for petroleum and natural gas extraction - B0910

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Extraction of aggregates - Quarrying of ornamental and building stone, limestone, gypsum, chalk and slate - B0811

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Extraction of aggregates - Operation of gravel and sand pits; mining of clays and kaolin - B0812

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Extraction of aggregates - Other mining and quarrying - B0899

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Seabed mining - Mining of iron ores - B0710

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Seabed mining - Mining of uranium and thorium ores - B0721

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Seabed mining - Mining of other non-ferrous metal ores - B0729

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Seabed mining - Support services to other mining and quarrying - B0990

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Maritime Transport - Sea and coastal passenger water transport - H5010

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Maritime Transport - Sea and coastal freight water transport - H5020

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Maritime Transport - Other transportation support activities - H5229

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Maritime Transport - Rental and leasing services of water transport equipment - N7734

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Ports - Warehousing and storage services - H5210

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Ports - Service activities incidental to water transportation - H5222

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Coastal Tourism - Land transport - H49

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Coastal Tourism - Water transport - H50

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Coastal Tourism - Air transport - H51

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Coastal Tourism - Accommodation - I55

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Coastal Tourism - Food and beverage service activities - I56

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Coastal Tourism - Renting and leasing of motor vehicles, recreational and sports gods - N77

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Coastal Tourism - Travel agency, tour operator reservation service and related activities - N79

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Coastal Tourism - Culture and entertainment - R90-92

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Energy - Production of electricity - D3511

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Military - Defence activities - O8422

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Construction - Construction of water project - F4291

Activity types

Parent

- *Socio-economic*

Edit online (for developers only)

Economic

Value types

Parent

- *Socio-economic*

Edit online (for developers only)

Social

Value types

Parent

- *Socio-economic*

Edit online (for developers only)

Population growth

Categories

Parent

- *Socio-economic*

Edit online (for developers only)

Population density

Categories

Parent

- *Socio-economic*

Edit online (for developers only)

Unemployment in coastal areas

Categories

Parent

- *Socio-economic*

Edit online (for developers only)

Employment rate

Categories

Parent

- *Socio-economic*

Edit online (for developers only)

Income distribution

Categories

Parent

- *Socio-economic*

Edit online (for developers only)

Migration patterns

Categories

Parent

- *Socio-economic*

Edit online (for developers only)

Edit online (for developers only)

14.1.7 Ecosystem Services

MSPdF Data Clusters

Provisioning (Biotic) - 1.1.1.2 Fibres and other materials from cultivated plants, fungi, algae and bacteria for direct use or processing (excluding genetic materials)

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.1.1.3 Cultivated plants (including fungi, algae) grown as a source of energy

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.1.2.1 Plants cultivated by in- situ aquaculture grown for nutritional purposes

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.1.2.2 Fibres and other materials from in-situ aquaculture for direct use or processing (excluding genetic materials)

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.1.2.3 Plants cultivated by in- situ aquaculture grown as an energy source

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.1.3.1 Animals reared for nutritional purposes

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.1.3.2 Fibres and other materials from reared animals for direct use or processing (excluding genetic materials)

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.1.3.3 Animals reared to provide energy (including mechanical)

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.1.4.1 Animals reared by in-situ aquaculture for nutritional purposes

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.1.4.2 Fibres and other materials from animals grown by in-situ aquaculture for direct use or processing (excluding genetic materials)

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.1.4.3 Animals reared by in-situ aquaculture as an energy source

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.1.5.1 Wild plants (terrestrial and aquatic, including fungi, algae) used for nutrition

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.1.5.2 Fibres and other materials from wild plants for direct use or processing (excluding genetic materials)

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.1.5.3 Wild plants (terrestrial and aquatic, including fungi, algae) used as a source of energy

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.1.6.1 Wild animals (terrestrial and aquatic) used for nutritional purposes

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.1.6.2 Fibres and other materials from wild animals for direct use or processing (excluding genetic materials)

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.1.6.3 Wild animals (terrestrial and aquatic) used as a source of energy

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.2.1.1 Seeds, spores and other plant materials collected for maintaining or establishing a population

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.2.1.2 Higher and lower plants (whole organisms) used to breed new strains or varieties

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.2.1.3 Individual genes extracted from higher and lower plants for the design and construction of new biological entities

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.2.2.1 Animal material collected for the purposes of maintaining or establishing a population

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.2.2.2 Wild animals (whole organisms) used to breed new strains or varieties

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.2.2.3 Individual genes extracted from organisms for the design and construction of new biological entities

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Biotic) - 1.3.X.X Other

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.1.1.1 Bio-remediation by micro-organisms, algae, plants, and animals

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.1.1.2 Filtration/sequestration/storage/accumulation by micro-organisms, algae, plants, and animals

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.1.2.1 Smell reduction

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.1.2.2 Noise attenuation

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.1.2.3 Visual screening

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.2.1.1 Control of erosion rates

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.2.1.2 Buffering and attenuation of mass movement

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.2.1.3 Hydrological cycle and water flow regulation (Including flood control, and coastal protection)

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.2.1.4 Wind protection

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.2.1.5 Fire protection

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.2.2.1 Pollination (or 'gamete' dispersal in a marine context)

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.2.2.2 Seed dispersal

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.2.2.3 Maintaining nursery populations and habitats (Including gene pool protection)

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.2.3.1 Pest control (including invasive species)

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.2.3.2 Disease control

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.2.4.1 Weathering processes and their effect on soil quality

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.2.4.2 Decomposition and fixing processes and their effect on soil quality

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.2.5.1 Regulation of the chemical condition of freshwaters by living processes

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.2.5.2 Regulation of the chemical condition of salt waters by living processes

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.2.6.1 Regulation of chemical composition of atmosphere and oceans

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.2.6.2 Regulation of temperature and humidity, including ventilation and transpiration

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Biotic) - 2.3.X.X Other

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Cultural (Biotic) - 3.1.1.1 Characteristics of living systems that that enable activities promoting health, recuperation or enjoyment through active or immersive interactions

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Cultural (Biotic) - 3.1.1.2 Characteristics of living systems that enable activities promoting health, recuperation or enjoyment through passive or observational interactions

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Cultural (Biotic) - 3.1.2.1 Characteristics of living systems that enable scientific investigation or the creation of traditional ecological knowledge

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Cultural (Biotic) - 3.1.2.2 Characteristics of living systems that enable education and training

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Cultural (Biotic) - 3.1.2.3 Characteristics of living systems that are resonant in terms of culture or heritage

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Cultural (Biotic) - 3.1.2.4 Characteristics of living systems that enable aesthetic experiences

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Cultural (Biotic) - 3.2.1.1 Elements of living systems that have symbolic meaning

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Cultural (Biotic) - 3.2.1.2 Elements of living systems that have sacred or religious meaning

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Cultural (Biotic) - 3.2.1.3 Elements of living systems used for entertainment or representation

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Cultural (Biotic) - 3.2.2.1 Characteristics or features of living systems that have an existence value

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Cultural (Biotic) - 3.2.2.2 Characteristics or features of living systems that have an option or bequest value

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Cultural (Biotic) - 3.3.X.X Other

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Abiotic) - 4.2.1.1 Surface water for drinking

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Abiotic) - 4.2.1.2 Surface water used as a material (non-drinking purposes)

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Abiotic) - 4.2.1.3 Freshwater surface water used as an energy source

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Abiotic) - 4.2.1.4 Coastal and marine water used as energy source

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Abiotic) - 4.2.2.1 Ground (and subsurface) water for drinking

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Abiotic) - 4.2.2.2 Ground water (and subsurface) used as a material (non-drinking purposes)

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Abiotic) - 4.2.2.3 Ground water (and subsurface) used as an energy source

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Abiotic) - 4.2.X.X Other

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Abiotic) - 4.3.1.1 Mineral substances used for nutritional purposes

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Abiotic) - 4.3.1.2 Mineral substances used for material purposes

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Abiotic) - 4.3.1.3 Mineral substances used for as an energy source

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Abiotic) - 4.3.2.1 Non-mineral substances or ecosystem properties used for nutritional purposes

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Abiotic) - 4.3.2.2 Non-mineral substances used for materials

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Abiotic) - 4.3.2.3 Wind energy

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Abiotic) - 4.3.2.4 Solar energy

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Abiotic) - 4.3.2.5 Geothermal

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Provisioning (Abiotic) - 4.3.2.6 Other

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Abiotic) - 5.1.1.1 Dilution by freshwater and marine ecosystems

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Abiotic) - 5.1.1.2 Dilution by atmosphere

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Abiotic) - 5.1.1.3 Mediation by other chemical or physical means (e.g. via Filtration, sequestration, storage or accumulation)

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Abiotic) - 5.1.2.1 Mediation of nuisances by abiotic structures or processes

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Abiotic) - 5.2.1.1 Mass flows

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Abiotic) - 5.2.1.2 Liquid flows

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Abiotic) - 5.2.1.3 Gaseous flows

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Abiotic) - 5.2.2.1 Maintenance and regulation by inorganic natural chemical and physical processes

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Regulation & Maintenance (Abiotic) - 5.3.X.X Other

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Cultural (Abiotic) - 6.1.1.1 Natural, abiotic characteristics of nature that enable active or passive physical and experiential interactions

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Cultural (Abiotic) - 6.1.2.1 Natural, abiotic characteristics of nature that enable intellectual interactions

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Cultural (Abiotic) - 6.2.1.1 Natural, abiotic characteristics of nature that enable spiritual, symbolic and other interactions

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Cultural (Abiotic) - 6.2.2.1 Natural, abiotic characteristics or features of nature that have either an existence, option or bequest value

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Cultural (Abiotic) - 6.3.X.X Other

CICES classes

Parent

- *Ecosystem Services*

Edit online (for developers only)

Edit online (for developers only)

14.1.8 Legal, Governance & Planning

MSPdF Data Clusters

Legal status / Maritime zones

Themes

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Fisheries

Themes

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Aquaculture

Themes

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Oil & Gas

Themes

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Offshore Renewable Energy

Themes

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Maritime Transport and Ports

Themes

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Military uses

Themes

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Dredging and dumping of dredged materials

Themes

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Coastal defence

Themes

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Desalination

Themes

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Coastal tourism

Themes

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Nautical sports, leisure boating and marinas

Themes

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Underwater cultural heritage

Themes

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Safety and Surveillance

Themes

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Environment (e.g. pollution and biodiversity)

Themes

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Conservation (i.e. Protected areas)

Themes

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Strategic - International

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Strategic - EU

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Strategic - National

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Strategic - Regional

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Legislation - International

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Legislation - EU

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Legislation - National

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Legislation - Regional

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Planning - International

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Planning - EU

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Planning - National

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Planning - Regional

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Administrative - National

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Administrative - Regional

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Enforcement - Motoring

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Enforcement - Control

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Judicial application - International

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Judicial application - EU

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Judicial application - National

Functions

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Who is in charge?

Who is in charge?

Parent

- *Legal, Governance & Planning*

Edit online (for developers only)

Edit online (for developers only)

14.1.9 Relevance

MSPdF Data Clusters

International - present - High

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

International - present - Medium

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

International - present - Low

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

International - future - High

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

International - future - Medium

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

International - future - Low

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

National - present - High

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

National - present - Medium

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

National - present - Low

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

National - future - High

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

National - future - Medium

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

National - future - Low

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

Sub-area - present - High

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

Sub-area - present - Medium

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

Sub-area - present - Low

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

Sub-area - future - High

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

Sub-area - future - Medium

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

Sub-area - future - Low

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

Local - present - High

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

Local - present - Medium

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

Local - present - Low

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

Local - future - High

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

Local - future - Medium

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

Local - future - Low

Relevance (spatial and temporal)

Parent

- *Relevance*

Edit online (for developers only)

Edit online (for developers only)

CHAPTER

FIFTEEN

DATASETS

15.1 Marine & Coastal Environment

15.1.1 EMODnet Seabed habitat map (EUSeaMap)

Description

The EMODnet broad-scale seabed habitat map for Europe (EUSeaMap) is a comprehensive, free and ready-to-use broad-scale map of physical habitats, harmonising mapping procedures and fostering a common understanding among seabed mappers in Europe. The map was produced using a "top-down" modelling approach using classified habitat descriptors, including biological zone, energy class, oxygen regime, salinity regime, seabed substrate, and riverine input. The most recent version is EUSeaMap 2023. EMODnet data can be viewed, browsed, subsetted and downloaded using EMODnet"s Map Viewer.

Edit online (for developers only)

CHAPTER SIXTEEN

APPLICATION EXAMPLES

16.1 Marime Mammals & CC: NW Mediterranean prioritization for 2030

Related Questions

- *Q 10 - How to protect marine mammals?*

16.1.1 Description

In this example, the geographical and time scale boundaries are well defined, and we know that climate change need to be considered:

- Criterion 1 Desirable spatio-temporal scale of the analysis (Highlighting the boundaries) application: Projections need to be "Near Term" and limited to the Med Sea (so the considered stressor is mainly Sea Surface Temperature regarding actual data availability and knowledge.)
- Criterion 2 Type of output application: the output should be a metric that could be ranked (score or quantitative) as the main purpose of the question is to compare and prioritize species. Trait-based vulnerability assessment is suitable as it will evaluate the influence of climate change on the species and provide a metric for comparison.
- Criterion 3 Expertise/Complexity of the model application: Marine mammals are moving species that will probably move before presenting the appearance of adaptations to climate change. Moreover, near-term questions are less likely to induce evolutionary process. For these reasons, a trait-based vulnerability assessment based only on Sensitivity criteria is particularly suitable to compare the near-term answers between species and will be selected to feed the macro-criterion Vulnerability in the Analysis and Diagnosis Practices. The selection of a single criterion among the criteria feeding the Vulnerability macro-criterion will respect the parsimony approach (simple equation) and lead to an acceptable level of uncertainty.
- Final output of the scoping: in this example, the output of the scoping will be to use a Trait-based vulnerability assessment based only on Sensitivity criteria to sea surface temperature.

Source Cambra et al (2024). Guidance for including climate change scenarios in protection and prioritization strategies for Marine Protected Areas development. Deliverable D3.3, under the WP3 of MSP4BIO project (GA n° 101060707)

Edit online (for developers only)

16.2 Application of the HELCOM SPIA Tool for HELCOM MPAs

Related Questions

- *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*

Related Operational Approaches

- *HELCOM SPIA Tool*

Related Test Sites

- *Baltic Sea basin and Vistula Lagoon/Southern Baltic*

16.2.1 Description

Introduction

MSP4BIO Baltic Sea test site performed a detailed analysis of spatial pressures and impacts within HELCOM Marine Protected Areas (MPAs) using the HELCOM SPIA tool. The exercise includes the evaluation of various environmental pressures, ecosystem components, and the level of human impact inside the MPAs. The aim of the assessment is to identify the most impacted ecosystem components, the most significant pressures in HELCOM MPAs, and also to highlight the most affected MPAs.

Most impacted ecosystem components in HELCOM MPAs

Through the analysis, certain ecosystem components were found to be more impacted than others in HELCOM MPAs. Bottom-water habitats not influenced by permanent stratification showed the highest total impact. The primary pressures affecting this component were physical disturbance, eutrophication and hazardous substances. In addition, grey seals and harbour porpoises were highly affected, likely due to pressures such as input of continuous anthropogenic sound.

Most significant pressures causing impact

The analysis reveals that the contribution of hazardous substances and eutrophication were among the highest pressures causing impact inside HELCOM MPAs. These pressures are largely driven by land-based activities, such as industrial discharges and agricultural runoff, which release pollutants and excess nutrients into the Baltic Sea. Despite MPAs being established to protect critical ecosystems, they often lack the regulatory authority to control or limit these external pressures. This highlights a crucial management challenge: while MPAs can regulate direct human activities like fishing or tourism within their boundaries, they remain vulnerable to diffusing, widespread pressures originating outside their jurisdiction. Understanding the significant contribution of hazardous substances and eutrophication is essential for informing broader regional strategies that target these issues at their source. Several other pressures, such as physical disturbance, non-indigenous species, disturbance from human presence, and anthropogenic sound, are also highly relevant within HELCOM MPAs. Physical disturbance from activities like bottom trawling can degrade sensitive seabed habitats, while non-indigenous species, introduced through shipping, can disrupt local ecosystems by outcompeting native species. Human presence in areas critical for breeding or feeding disrupts wildlife behavior, particularly for birds and marine mammals, reducing reproductive success. Additionally, anthropogenic sound from shipping and construction interferes with species that rely on sound for navigation and communication. Though MPAs can regulate some local activities, mitigating these pressures often requires broader regional and international actions.

Most Impacted HELCOM MPAs

HELCOM MPAs	Country	Mean impact
Rügensche Bodden	Germany	43.86236
Greifswalder Bodden und Strelasund	Germany	38.05835
Pakri	Estonia	36.7603
Porvoonjoen suisto - Stensböle /Porvoonjoki estuary-Stensböle	Finland	34.44609
Tammisaaren ja Hangon saariston ja Pohjanpitäjänlahden merensuojelualue /Tammisaari and Hanko Archipelago-and Pojo Bay marine proteciton area	Finland	34.01314
Väinameri	Estonia	33.47418
Kirkkonummen saaristo/ Kirkkonummi Archipelago	Finland	33.25499
Odense Fjord	Denmark	32.19698
Kvädöfjärden med Torrö	Sweden	31.88792
Tulliniemen linnustonsuojelualue/ Tulliniemi bird protection area	Finland	31.56984

16.2.2 Resources

SPIA tool outcome showing the most impacted areas in HELCOM MPAs.

Red represents high impact and yellow represents the low impact areas.

HELCOM MPAs by their mean impact score.

Red represents high impact and yellow represents the low imp

Impact level by pressure category in HELCOM MPAs

Most impacted ecosystem components in HELCOM MPAs

Most impacted MPA

Url https://stateofthebalticsea.helcom.fi/findings/distribution/baltic-sea-pressure-and-impact-indices/

Edit online (for developers only)

CHAPTER SEVENTEEN

BALTIC SEA BASIN AND VISTULA LAGOON/SOUTHERN BALTIC

Related Questions

- *Q 65 - How can we assess CC impacts on fishing stocks (e.g. cod and sprat) and develop strategies to protect these species across different life stages (e.g. focusing on nurseries and fishing grounds)?*
- *Q 24 - How do MPA policies intersect with MSP?*
- *Q 25 - How to integrate the process of MPA designation or extension in MSP?*
- *Q 27 - Are there good practices of MPA-MSP integration in terms of governance?*
- *Q 54 - How to anticipate and address climate change within MPA?*
- *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*
- *Q 53 - How to identify and analyze the main conflict areas between human uses and the environment?*
- *Q 8 - How to identify and analyze the main conflict area that may arise if we need to expand marine protected areas in response to sensitive habitats, ecological connectivity or other valuable ecological as*
- *Q 11 - How to integrate socio-econonomic objectives in assessment of existing MPA (network) and identification of new MPAs?*
- *Q 41 - What are the main objectives and elements of monitoring programs for MPAs?*

Related Applications

- *Application of the HELCOM SPIA Tool for HELCOM MPAs*

17.1 Description

The Baltic Sea, a semi-enclosed inland sea located in Northern Europe, serves as a transboundary sea basin. The sea area is 377,000 km^2 and stretches from 53°N to 66°N latitude and from 10°E to 30°E longitude. Its clear separation from the open ocean restricts water movement through the Danish Straits. Eight EU coastal countries share the Baltic coast (i.e., Germany, Denmark, Sweden. Finland, Estonia, Latvia, Lithuania and Poland) with Russia. The Baltic is one of the most brackish bodies of water in the world, receiving both ocean and river influx water. The average salinity of the Baltic Sea is around 7%. The Baltic Sea's ecosystem is particularly sensitive, responding quickly to external influences and pressures. Natural occurrences, such as environmental factor fluctuations, and anthropogenic effects, such as fisheries, pollution, or industrialization impact the sea measurably. The Baltic Sea features a fragile ecosystem under multiple human-induced environmental pressures, both on land and at sea. There is not a wide variety of sea life in the Baltic Sea in comparison with the sea basins located more to the south. It is possible to find algae, but flowering plants are less common. Fish are the dominant animal species, such as herring, cod, sprat, flounder, mackerel, flatfish, salmon and eel, but their population has drastically diminished recently. Occasionally large marine mammals can be found – porpoises and seals, which are under protection. The most common birds are terns, gulls and mute swans. There are also jellyfish, annelids (worms), small shellfish and crustaceans. The ecological status of the Baltic Sea waters is unsatisfactory. Influx of town and industrial sewage, as well as artificial fertilisers and pesticides washed out from fields results in eutrophication of marine waters. There are also accidents that result in fuel or other liquids leaking into the water since the Baltic Sea is one of the busiest sea basins in the world in terms of sea traffic. There are many wrecks and remnants of the Second World War that remain on the seabed. Key economic sectors are fisheries, aquaculture, tourism, renewables and mineral extraction. Conservation efforts are coordinated by the Helsinki Commission (international convention) since 1974. Gdansk Bay, located in the southern Baltic Sea, is highlighted as an ecologically diverse area that supports a wide range of marine species and human activities such as fishing, shipping, and recreation. The task focus was on identifying and analysing potential conflicts arising from the proposed expansion of Marine Protected Areas (MPAs) to protect sensitive habitats, ensure ecological connectivity, and preserve valuable environmental assets. The potential conflicts with tourism, bottom trawling, coastal fishery, and shipping are outlined as areas of concern. The key characteristics of the test site are following: Transboundary sea basin; Ecosystem under multiple human-induced pressures; Need for more designated MPAs to achieve the regional goals; Need for coordinated plans for human activities.

Sources

Matczak et al. (2024) Test Sites Methodology Including the Participation Strategy (Deliverable – D5.2., under the WP5 of MSP4BIO project (GA n° 101060707)).

17.2 Questions

17.2.1 How can we assess CC impacts on fishing stocks (e.g. cod and sprat) and develop strategies to protect these species across different life stages (e.g. focusing on nurseries and fishing grounds)?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Non-strict protection

Marine zones: Offshore zone

17.2.2 How do MPA policies intersect with MSP?

Question / answers details

Answer

Practices: *Data collection and presentation*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone Deep sea Offshore zone

Answer

Practices: *[Not Related to Any Practice]*

17.2.3 How to integrate the process of MPA designation or extension in MSP?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: National Regional / local
Protection regimes: Strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Answer

17.2.4 Are there good practices of MPA-MSP integration in terms of governance?

Question / answers details

Answer

Practices: *[Not Related to Any Practice]*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

17.2.5 How to anticipate and address climate change within MPA?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

17.2.6 How to evaluate cumulative impacts in MSP and MPA?

Question / answers details

Answer

Practices: *Data collection and presentation Analysis and diagnosis Prioritisation and designation Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection

Answer

Practices: *Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection

Answer

Practices: *Analysis and diagnosis*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone
Applications: *Application of the HELCOM SPIA Tool for HELCOM MPAs*

Answer

Practices: *Analysis and diagnosis*
Spatial scales: National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Offshore zone

Measures

Practices: *Data collection and presentation Analysis and diagnosis Prioritisation and designation Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local

Measures

Practices: *Analysis and diagnosis*
Spatial scales: National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea

17.2.7 How to identify and analyze the main conflict areas between human uses and the environment?

Question / answers details

Answer

Practices: *Scoping*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone Deep sea Offshore zone

17.2.8 How to identify and analyze the main conflict area that may arise if we need to expand marine protected areas in response to sensitive habitats, ecological connectivity or other valuable ecological as

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Offshore zone

Answer

Spatial scales: National Regional / local

Measures

Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

17.2.9 How to integrate socio-econonomic objectives in assessment of existing MPA (network) and identification of new MPAs?

Question / answers details

Answer

Practices: *Scoping*

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: National Regional / local

Protection regimes: Strict protection Non-strict protection

Answer

Practices: *Scoping*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Answer

Practices: *Scoping Analysis and diagnosis Prioritisation and designation Implementation and management*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Measures

Practices: *Implementation and management*
Spatial scales: National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

17.2.10 What are the main objectives and elements of monitoring programs for MPAs?

Question / answers details

Answer

Practices: *Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Answer

Practices: *Monitoring and evaluation*
Spatial scales: National Regional / local
Protection regimes: Strict protection Non-strict protection

CHAPTER

EIGHTEEN

WESTERN BLACK SEA

Related Questions

- *Q 61 - How can reliability/accuracy of the spatial data for MPA identification be improved?*
- *Q 64 - How to deal with knowledge gaps on impacts of maritime activities, including cumulative impacts?*
- *Q 25 - How to integrate the process of MPA designation or extension in MSP?*
- *Q 55 - How to anticipate and address climate change within a MPA network?*
- *Q 56 - How to anticipate changes in biotopes due to climate change?*
- *Q 57 - How to prioritize areas to be protected in view of climate changes (including shertered areas)?*
- *Q 28 - How to create/increase stakeholder knowledge, awareness and engagement on MPAs and MSP?*
- *Q 12 - How to evaluate cumulative impacts in MSP and MPA?*
- *Q 8 - How to identify and analyze the main conflict area that may arise if we need to expand marine protected areas in response to sensitive habitats, ecological connectivity or other valuable ecological as*
- *Q 11 - How to integrate socio-econonomic objectives in assessment of existing MPA (network) and identification of new MPAs?*
- *Q 46 - Hot to identify compensation measures and how to assess their effectiveness?*
- *Q 45 - How to assess economic impacts of conservation measures?*
- *Q 13 - How to evaluate trade-offs in MSP and MPA designation process?*
- *Q 16 - How to prioritize areas for conservation (designation of new MPAs)?*
- *Q 58 - How to protect vulnerable species against climatic stressors?*
- *Q 33 - What are the environmental legislation/criteria guidance for MPA designation including socio-economic criteria (Commission's SWD, EU Directives, IUCN, new criteria UNCLOS?)*
- *Q 48 - How to reduce risks (e.g. of collision) and impacts (e.g. from noise pollution) on key cetacean species, particularly during the breeding season and in sensitive areas?*
- *Q 39 - What criteria are available to assess sustainability of maritime uses?*
- *Q 14 - How to assess compatibility of maritime uses and MPA conservation objectives? How to prioritize uses?*

18.1 Description

The Western Black Sea test site (from Cape Tuzla to Cape Kaliakra) is part of the Black Sea. This is a coastal, onshore and offshore sub-sea basin of the size 2,750 km2. The test site is shared by Bulgaria and Romania, so from its nature it is a cross-border testing site covering both territorial waters and the EEZ. The relevant blue sectors are fisheries and tourism. The following are key characteristic features of the test site: Diversity of marine domains; MPAs support huge biodiversity and ecosystem services; MPAs are fragmented with limited operational management.

Sources

Matczak et al. (2024) Test Sites Methodology Including the Participation Strategy (Deliverable – D5.2., under the WP5 of MSP4BIO project (GA n° 101060707))

18.2 Questions

18.2.1 How can reliability/accuracy of the spatial data for MPA identification be improved?

Question / answers details

Answer

Practices: *Monitoring and evaluation*

Policy solutions

18.2.2 How to deal with knowledge gaps on impacts of maritime activities, including cumulative impacts?

Question / answers details

Answer

Practices: *Data collection and presentation Analysis and diagnosis*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Offshore zone

18.2.3 How to integrate the process of MPA designation or extension in MSP?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: National Regional / local
Protection regimes: Strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Answer

18.2.4 How to anticipate and address climate change within a MPA network?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

18.2.5 How to anticipate changes in biotopes due to climate change?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

18.2.6 How to prioritize areas to be protected in view of climate changes (including shertered areas)?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

18.2.7 How to create/increase stakeholder knowledge, awareness and engagement on MPAs and MSP?

Question / answers details

Answer

Practices: *Scoping Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

18.2.8 How to evaluate cumulative impacts in MSP and MPA?

Question / answers details

Answer

Practices: *Data collection and presentation Analysis and diagnosis Prioritisation and designation Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection

Answer

Practices: *Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection

Answer

Practices: *Analysis and diagnosis*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone
Applications: *Application of the HELCOM SPIA Tool for HELCOM MPAs*

Answer

Practices: *Analysis and diagnosis*
Spatial scales: National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Offshore zone

Measures

Practices: *Data collection and presentation Analysis and diagnosis Prioritisation and designation Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local

Measures

Practices: *Analysis and diagnosis*
Spatial scales: National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea

18.2.9 How to identify and analyze the main conflict area that may arise if we need to expand marine protected areas in response to sensitive habitats, ecological connectivity or other valuable ecological as

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Offshore zone

Answer

Spatial scales: National Regional / local

Measures

Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

18.2.10 How to integrate socio-econonomic objectives in assessment of existing MPA (network) and identification of new MPAs?

Question / answers details

Answer

Practices: *Scoping*

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: National Regional / local
Protection regimes: Strict protection Non-strict protection

Answer

Practices: *Scoping*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Answer

Practices: *Scoping Analysis and diagnosis Prioritisation and designation Implementation and management*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Measures

Practices: *Implementation and management*
Spatial scales: National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

18.2.11 Hot to identify compensation measures and how to assess their effectiveness?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

18.2.12 How to assess economic impacts of conservation measures?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

18.2.13 How to evaluate trade-offs in MSP and MPA designation process?

Question / answers details

Answer

Practices: *Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection

Answer Measures

Practices: *Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local

Measures

18.2.14 How to prioritize areas for conservation (designation of new MPAs)?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

18.2.15 How to protect vulnerable species against climatic stressors?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

18.2.16 What are the environmental legislation/criteria guidance for MPA designation including socio-economic criteria (Commission's SWD, EU Directives, IUCN, new criteria UNCLOS?)

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

18.2.17 How to reduce risks (e.g. of collision) and impacts (e.g. from noise pollution) on key cetacean species, particularly during the breeding season and in sensitive areas?

Question / answers details

Answer

Practices: *Implementation and management*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Offshore zone

18.2.18 What criteria are available to assess sustainability of maritime uses?

Question / answers details

Answer

Practices: *Scoping*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Answer

Practices: *Analysis and diagnosis Monitoring and evaluation*
Spatial scales: National Regional / local
Protection regimes: Strict protection Non-strict protection

18.2.19 How to assess compatibility of maritime uses and MPA conservation objectives? How to prioritize uses?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: National Regional / local
Protection regimes: Non-strict protection

Answer Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Measures

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

Measures Measures

Practices: *Analysis and diagnosis*
Spatial scales: National
Protection regimes: Strict protection
Marine zones: Deep sea

CHAPTER NINETEEN

GULF OF CADIZ

Related Questions

- *Q 47 - How to address the different scales of management (MSP-MPA) in an ESE framework?*
- *Q 32 - How to create a culture of collaboration among MSP, MPA and sector responsible institutions?*
- *Q 31 - How to move from participation to engagement and co-creation, transforming participation in a cultural behaviour?*
- *Q 43 - How to monitor Ecosystem Services highlighting their linkages to the different high priority socio-economic criteria identified in each site?*

19.1 Description

The Bay of Cádiz (Bahía de Cádiz) is a body of water in the province of Cádiz, Spain, adjacent to the south-western coast of the Iberian Peninsula. The shores of the Bay of Cádiz include the municipalities of Cádiz, San Fernando, Puerto Real, El Puerto de Santa María, and Rota. The bay forms a natural harbour. The Bahía de Cádiz Natural Park is located on the shores of the Bay of Cádiz. Relevant blue sectors: Fisheries, aquaculture and tourism. The Bay of Cadiz is part of Spanish Atlantic waters named the South Atlantic “Sudatlántica” marine demarcation, - an area of 14,978.3 km2. Characteristics of the test site are as follows: Hot spots with special needs for MSP and MPA; Need for improvement of MSP and stronger consideration of land-sea interactions; Nearby human activities threaten MPAs.

Sources

Matczak et al. (2024) Test Sites Methodology Including the Participation Strategy (Deliverable – D5.2., under the WP5 of MSP4BIO project (GA n° 101060707))

19.2 Questions

19.2.1 How to address the different scales of management (MSP-MPA) in an ESE framework?

Question / answers details

19.2.2 How to create a culture of collaboration among MSP, MPA and sector responsible institutions?

Question / answers details

19.2.3 How to move from participation to engagement and co-creation, transforming participation in a cultural behaviour?

Question / answers details

19.2.4 How to monitor Ecosystem Services highlighting their linkages to the different high priority socio-economic criteria identified in each site?

Question / answers details

Answer

Practices: *Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Measures

Practices: *Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

CHAPTER

TWENTY

BELGIAN PART OF THE NORTH SEA

Related Questions

- *Q 16 - How to prioritize areas for conservation (designation of new MPAs)?*
- *Q 17 - How to identify priority areas for conservation of pelagic biodiversity?*
- *Q 18 - How to identify priority areas for preserving/restoring reef-forming species such as oysters Lanice conchilega or mussels?*
- *Q 6 - What are the priority areas for preserving from climate change effects the reef-former Lanice conchilega?*
- *Q 14 - How to assess compatibility of maritime uses and MPA conservation objectives? How to prioritize uses?*

20.1 Description

The Belgian part of the North Sea (BPNS) is found in the Southern Bight of the North Sea and borders the Exclusive Economic Zone (EEZ) of France, the Netherlands and the UK. The test site covers 3,447 km2 (the entire Belgian EEZ). Leading blue economy sectors are fisheries, aquaculture, tourism, renewables and mineral extraction. Currently, 36.5% of the BPNS is designated as protected, through five Natura 2000 Marine Protected Areas (3 SPAs and 2 SACs), one marine reserve and a Ramsar site. The key characteristics of the test site are: Well-studied and monitored sea area with a second revision cycle of the MSP currently ongoing; The present conservation status of benthic habitats is unsatisfactory; Lack of conservation objectives and management related to pelagic habitats; New management plans include measures for nature restoration (e.g. oyster reefs); There are no official fine-scale geographical biodiversity assessments units.

Sources

Matczak et al. (2024) Test Sites Methodology Including the Participation Strategy (Deliverable – D5.2., under the WP5 of MSP4BIO project (GA n° 101060707))

20.2 Questions

20.2.1 How to prioritize areas for conservation (designation of new MPAs)?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

20.2.2 How to identify priority areas for conservation of pelagic biodiversity?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Non-strict protection
Marine zones: Offshore zone

Measures

20.2.3 How to identify priority areas for preserving/restoring reef-forming species such as oysters Lanice conchilega or mussels?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone

Answer

Practices: *[Not Related to Any Practice]*

Measures

20.2.4 What are the priority areas for preserving from climate change effects the reef-former Lanice conchilega?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea

20.2.5 How to assess compatibility of maritime uses and MPA conservation objectives? How to prioritize uses?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: National Regional / local
Protection regimes: Non-strict protection

Answer Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Measures

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

Measures Measures

Practices: *Analysis and diagnosis*
Spatial scales: National
Protection regimes: Strict protection
Marine zones: Deep sea

CHAPTER

TWENTYONE

NORTH-WESTERN MEDITERRANEAN (NW-MED)

Related Questions

- *Q 34 - How to achieve the strict protection area target of 10% by 2030 in marine areas?*
- *Q 38 - How to address ecological functionalities in conservation objectives?*
- *Q 60 - What is the impact of CC on deep ecosystems?*
- *Q 59 - What is the impact of CC on marine mammals?*
- *Q 35 - How to assess and develop scenarios for MPA networks representativeness, ecological coherence, adequacy, comprehensiveness and connectivity. also in transboundary contexts?*
- *Q 17 - How to identify priority areas for conservation of pelagic biodiversity?*
- *Q 36 - How to maintain mobile species persistence (and connectivity) and population/community persistence (passive connectivity) across a transboundary MPA?*
- *Q 7 - How to protect deep Vulnerable marine Ecosystems (VMEs) (strategies, measures, etc.)?*
- *Q 50 - How can deep-water VMEs be effectively identified and conserved with regards to anthropogenic impacts arising from human activities?*
- *Q 51 - How can we minimize the impact of bottom trawling on the growth and survival of gorgonians and other cold water corals located in the NWMED deep-water VMEs?*
- *Q 10 - How to protect marine mammals?*
- *Q 49 - How to manage cross-border MPAs for cetaceans conservation?*
- *Q 52 - How to protect pelagic habitats?*

21.1 Description

The Northwest Mediterranean (NW-Med) test site covers a cross-border area shared between three countries, France, Monaco and Italy, extending from the Gulf of Lion in France to the coast of Tuscany in Italy (Fig 21). It covers 130,000 km2 of sea area, consisting of coastal, offshore and deep-sea parts (internal sea waters, territorial sea waters and EEZ).The test site is at sub-sea basin scale with an important cross-border component (French, Italian and Monégasque EEZs in the Western Mediterranean Sea). It encompasses different spatial scales in terms of MPA management: from the local scale characterising small MPAs to the transnational and cross-border level of the Pelagos Sanctuary and governance complexity. Thus, there is a need to address management of the different spatial scales, from the small MPA to the transboundary level. The following are key characteristic features of the test site: Governance complexity as area is shared between 3 countries; Large spatial scale; Diversity of marine domains; Multiplicity of human activities. Key blue sectors in the test site encompass fisheries, aquaculture, tourism, renewables.

Sources

Matczak et al. (2024) Test Sites Methodology Including the Participation Strategy (Deliverable – D5.2., under the WP5 of MSP4BIO project (GA n° 101060707))

21.2 Questions

21.2.1 How to achieve the strict protection area target of 10% by 2030 in marine areas?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: National
Protection regimes: Strict protection
Marine zones: Coastal zone Offshore zone

21.2.2 How to address ecological functionalities in conservation objectives?

Question / answers details

Answer

Practices: *Scoping*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

21.2.3 What is the impact of CC on deep ecosystems?

Question / answers details

Answer

Practices: *Scoping Implementation and management*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Deep sea

21.2.4 What is the impact of CC on marine mammals?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National
Protection regimes: Strict protection Non-strict protection
Marine zones: Offshore zone

21.2.5 How to assess and develop scenarios for MPA networks representativeness, ecological coherence, adequacy, comprehensiveness and connectivity. also in transboundary contexts?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

21.2.6 How to identify priority areas for conservation of pelagic biodiversity?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Non-strict protection
Marine zones: Offshore zone

Measures

21.2.7 How to maintain mobile species persistence (and connectivity) and population/community persistence (passive connectivity) across a transboundary MPA?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis*
Spatial scales: Transboundary / sea basin
Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone Deep sea

21.2.8 How to protect deep Vulnerable marine Ecosystems (VMEs) (strategies, measures, etc.)?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea

Measures

21.2.9 How can deep-water VMEs be effectively identified and conserved with regards to anthropogenic impacts arising from human activities?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Deep sea

21.2.10 How can we minimize the impact of bottom trawling on the growth and survival of gorgonians and other cold water corals located in the NWMED deep-water VMEs?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Deep sea

21.2.11 How to protect marine mammals?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Offshore zone
Applications: *Marime Mammals & CC: NW Mediterranean prioritization for 2030*

21.2.12 How to manage cross-border MPAs for cetaceans conservation?

Question / answers details

Answer

Practices: *Implementation and management*
Spatial scales: Transboundary / sea basin
Protection regimes: Non-strict protection
Marine zones: Offshore zone

21.2.13 How to protect pelagic habitats?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National
Protection regimes: Non-strict protection
Marine zones: Deep sea Offshore zone

CHAPTER

TWENTYTWO

AZORES ARCHIPELAGO

Related Questions

- *Q 63 - How to deal with knowledge gaps on socio-economic data, including the spatial dimension?*
- *Q 62 - How to deal with knowledge gaps related to water column data to support establishment of conservation measures offshore?*
- *Q 25 - How to integrate the process of MPA designation or extension in MSP?*
- *Q 26 - How to take OECM into consideration in MSP where no legal instruments are in place?*
- *Q 29 - How to assess stakeholders' satisfaction in a MSP/MPA process?*
- *Q 30 - How to demostrate the effectiveness of conservation measures to stakeholders?*
- *Q 9 - How to effectively manage conservation areas including both terrestrial and marine zones?*
- *Q 11 - How to integrate socio-econonomic objectives in assessment of existing MPA (network) and identification of new MPAs?*
- *Q 42 - What monitoring approach can be taken for extensive MPA networks, expecially offshore ones?*

22.1 Description

The Azores is an autonomous region of Portugal located in the north Atlantic and composed of nine islands and a rich diversity of habitats. Graciosa Island (Portuguese: Ilha Graciosa), also referred to as the White Island, is a volcanic Atlantic Island in the Azores archipelago located around 1630km from the Portugal mainland. The island has an area of 60.65 km2, a length of 10 km and a width of 7 km. Its landscape is dominated by a 1.6-km-wide central caldera (the Caldeira) located in the southeast. Population is above 4 thousand inhabitants. Coastal waters surrounding the island cover 971,582 km2 (EEZ and extended continental shelf). The most important blue economy sectors are fisheries and tourism. The key characteristics of the test site are the following: Rich habitat diversity – knowledge gaps in offshore and coastal areas; Need for strategies to enlarge MPA network in coastal areas and for "fully protected areas"; No Regional MSP approved so far (MSP plan is under public consultation).

Sources

Matczak et al. (2024) Test Sites Methodology Including the Participation Strategy (Deliverable – D5.2., under the WP5 of MSP4BIO project (GA n° 101060707))

22.2 Questions

22.2.1 How to deal with knowledge gaps on socio-economic data, including the spatial dimension?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Answer

Practices: *Data collection and presentation*
Spatial scales: Transboundary / sea basin National Regional / local

Marine zones: Coastal zone Offshore zone

22.2.2 How to deal with knowledge gaps related to water column data to support establishment of conservation measures offshore?

Question / answers details

22.2.3 How to integrate the process of MPA designation or extension in MSP?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: National Regional / local
Protection regimes: Strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Answer

22.2.4 How to take OECM into consideration in MSP where no legal instruments are in place?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone Deep sea Offshore zone

Answer

22.2.5 How to assess stakeholders' satisfaction in a MSP/MPA process?

Question / answers details

22.2.6 How to demostrate the effectiveness of conservation measures to stakeholders?

Question / answers details

Answer

Practices: *Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management Monitoring and evaluation*

Spatial scales: Transboundary / sea basin National Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone Deep sea Offshore zone

22.2.7 How to effectively manage conservation areas including both terrestrial and marine zones?

Question / answers details

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation Implementation and management*

Spatial scales: Regional / local

Protection regimes: Strict protection Non-strict protection

Marine zones: Coastal zone

Policy solutions

22.2.8 How to integrate socio-econonomic objectives in assessment of existing MPA (network) and identification of new MPAs?

Question / answers details

Answer

Practices: *Scoping*

Answer

Practices: *Scoping Data collection and presentation Analysis and diagnosis Prioritisation and designation*
Spatial scales: National Regional / local
Protection regimes: Strict protection Non-strict protection

Answer

Practices: *Scoping*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Answer

Practices: *Scoping Analysis and diagnosis Prioritisation and designation Implementation and management*
Spatial scales: Transboundary / sea basin National Regional / local
Protection regimes: Strict protection Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

Measures

Practices: *Implementation and management*
Spatial scales: National Regional / local
Protection regimes: Non-strict protection
Marine zones: Coastal zone Deep sea Offshore zone

22.2.9 What monitoring approach can be taken for extensive MPA networks, especially offshore ones?

Question / answers details

Answer

Practices: *Scoping*
Spatial scales: Transboundary / sea basin National
Protection regimes: Strict protection Non-strict protection
Marine zones: Offshore zone

CHAPTER

TWENTYTHREE

OVERALL STATISTICS ON ESE FRAMEWORK

Table 23.1: ESE Elements

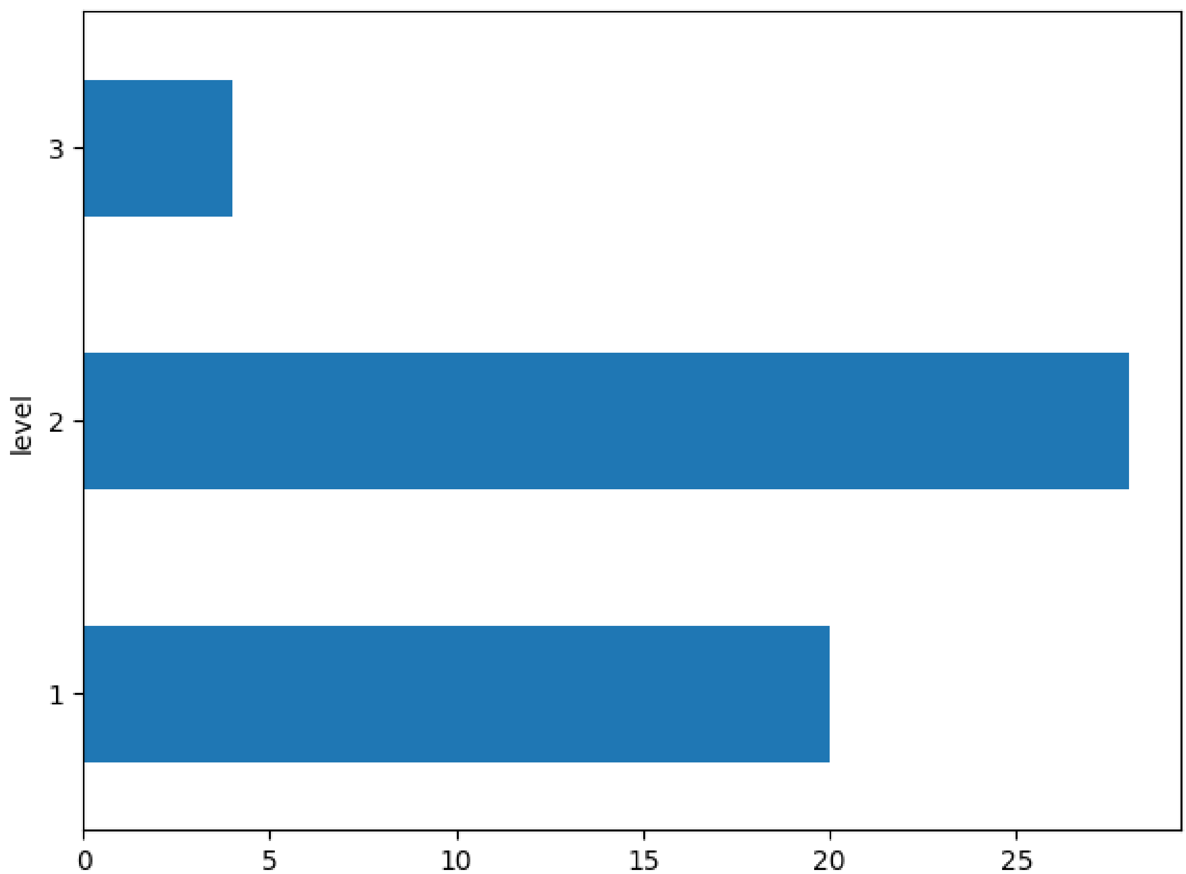
Element	Count
Management Needs	4
MSP Stages	9
Practices	7
Questions	52
Answers	67
Criteria Classes	20
Criteria	61
Measures	74
Operational Approaches	19
Applications	2
Test Sites	6

CHAPTER

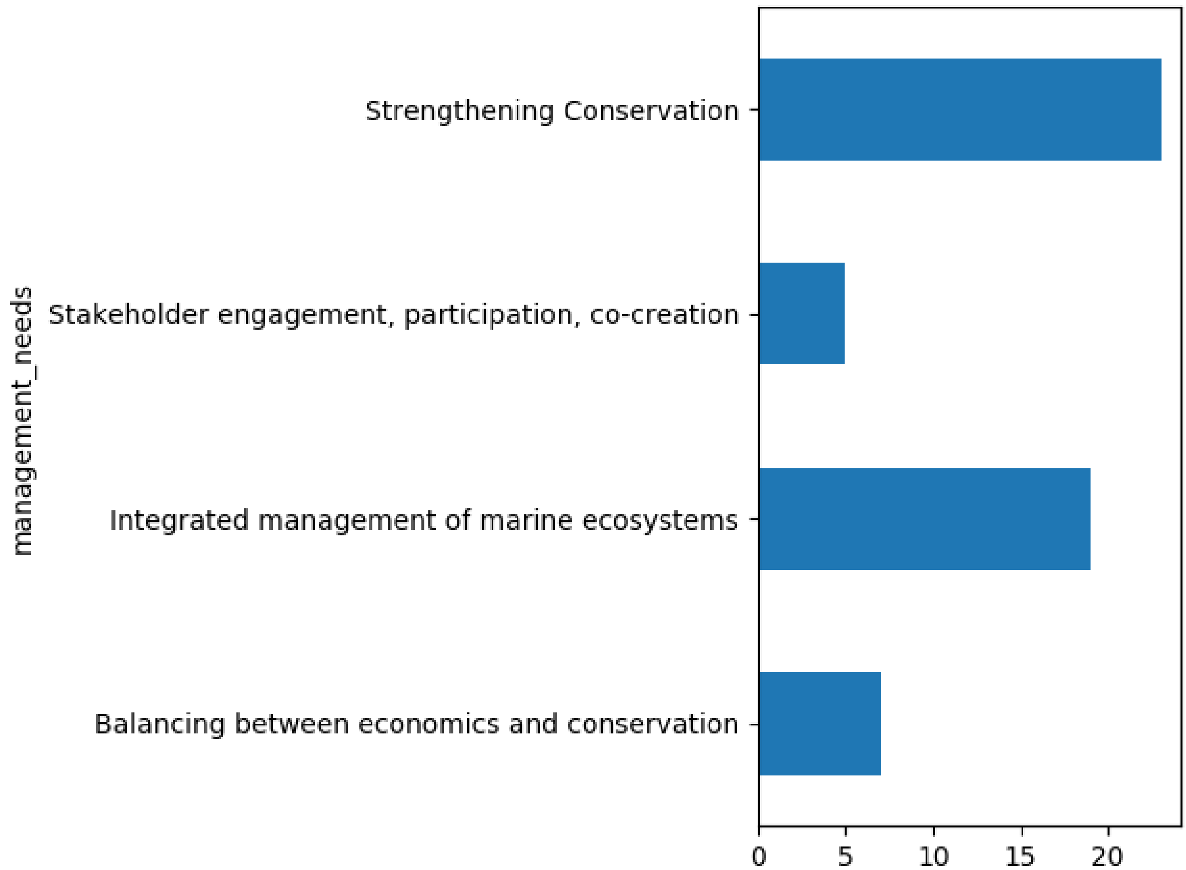
TWENTYFOUR

STATISTICS ON ESE QUESTIONS

24.1 Question level



24.2 Management needs



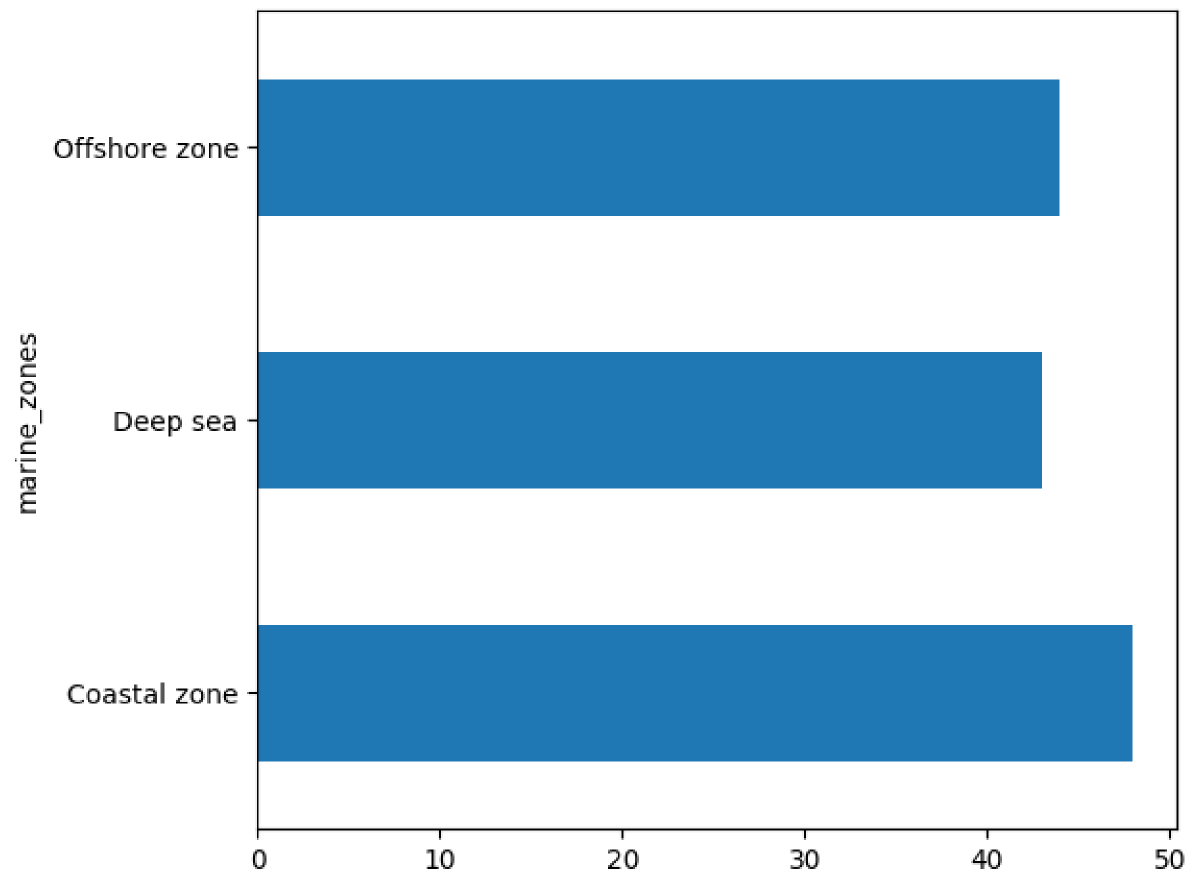
24.3 Marine zones

24.4 MSP Stages

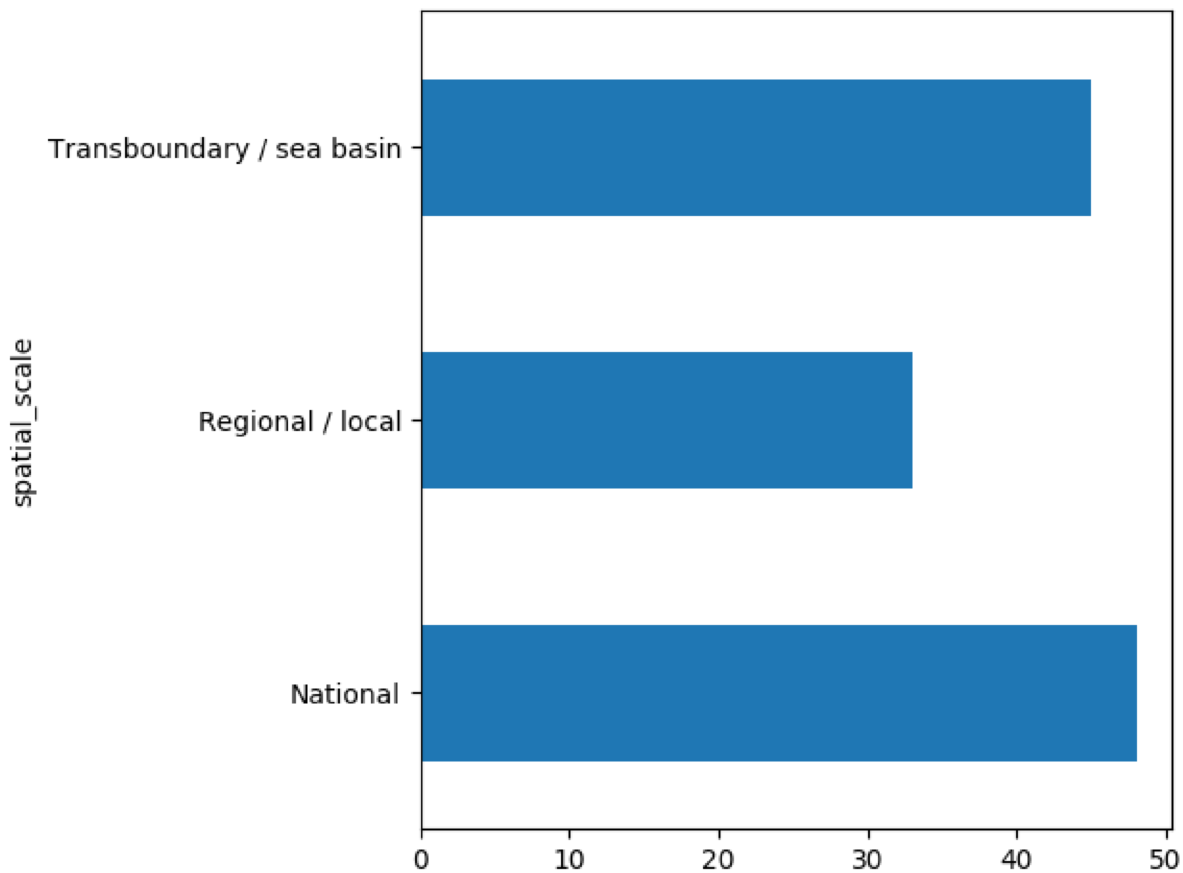
24.5 Spatial scales

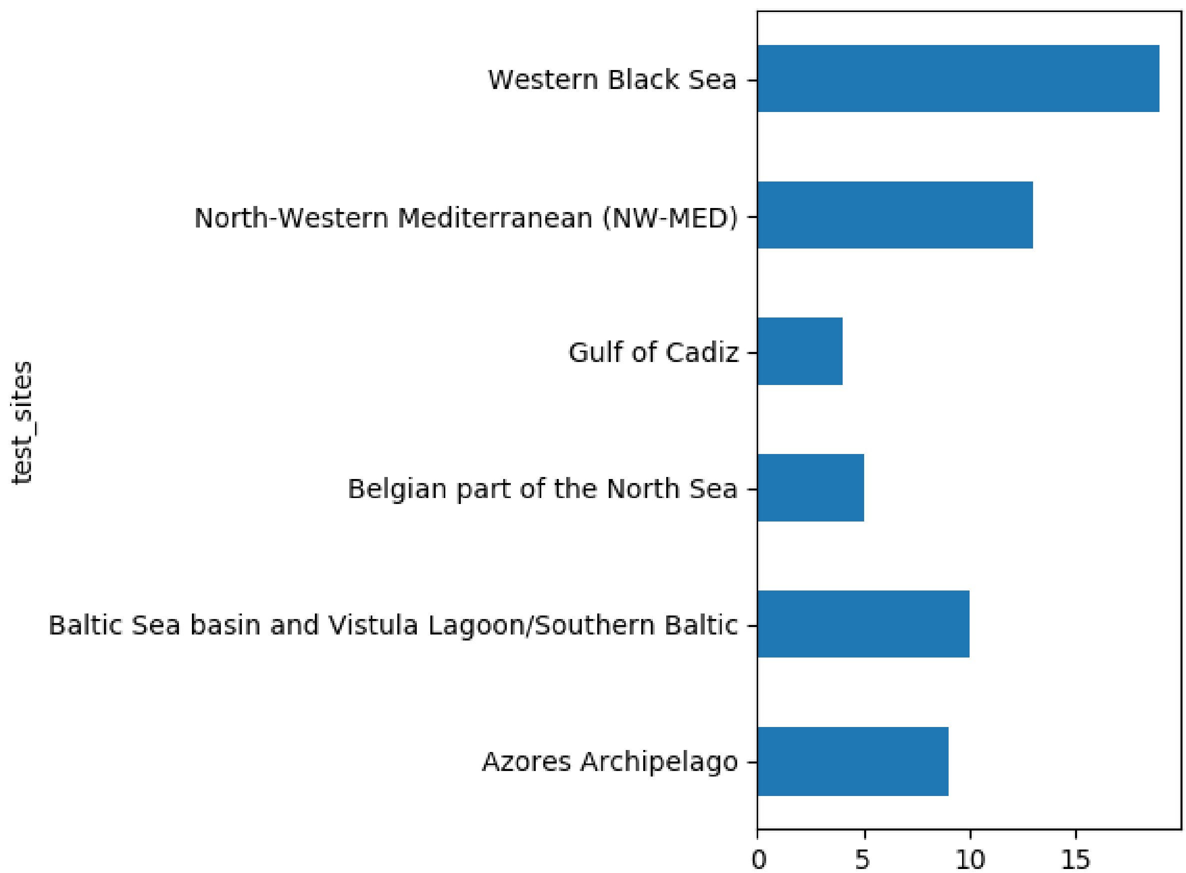
24.6 Test sites

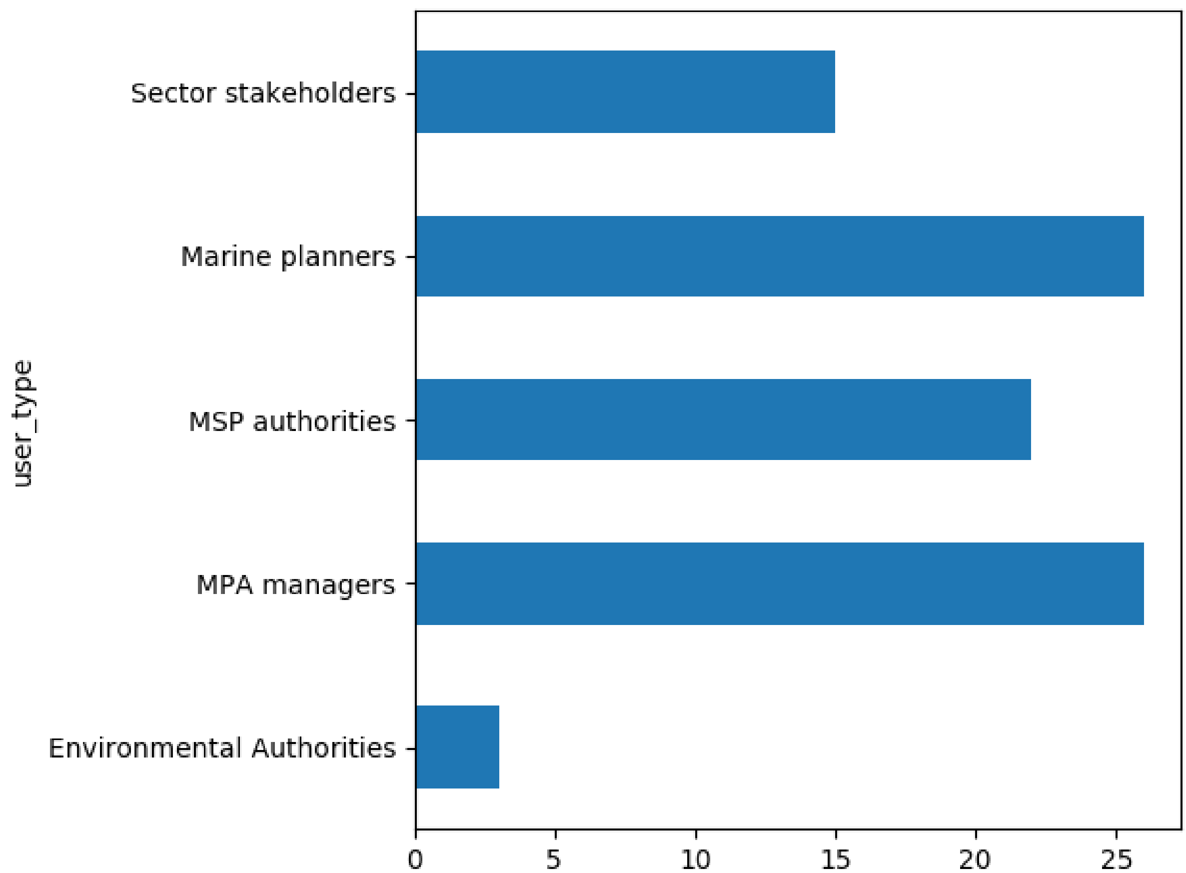
24.7 User type


Offshore zone
Deep sea
Coastal zone
marine_zones
0
10
20
30
40
50


Starting the process
Assessing the context and defining a vision
Analyzing existing and future conditions
Identifying key issues
Elaborating the plan
Implementing
Monitoring
Assessment
Revision
msp_stages
0
10
20
30
40
50


Transboundary / sea basin
Regional / local
National
spatial_scale
0
10
20
30
40
50


Western Black Sea
North-Western Mediterranean (NW-MED)
Gulf of Cadiz
Belgian part of the North Sea
Baltic Sea basin and Vistula Lagoon/Southern Baltic
Azores Archipelago
test_sites
0
5
10
15


Sector stakeholders
Marine planners
MSP authorities
MPA managers
Environmental Authorities
user_type
0
5
10
15
20
25

CHAPTER

TWENTYFIVE

INDICES AND TABLES

- genindex
- search